


AUTOMATIC PRODUCTS international, Ltd.

Showcase®
748

OPERATING MANUAL

PARTS MANUAL

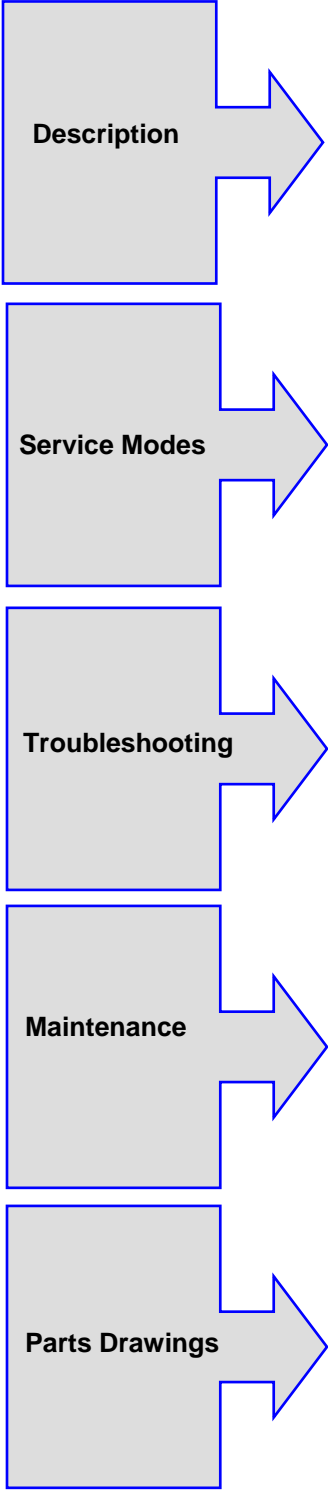
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REMOVE MANUAL
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AUTOMATIC  **PRODUCTS**
international, Ltd.

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WARRANTY

Automatic Products international ltd. (APi) expressly warrants these automatic merchandisers (the "Unit"), manufactured by it, to be free under normal use and service from defects in material or workmanship for a period of two (2) years from the date of delivery of this Unit to the original purchaser. This warranty extends only to the original purchaser of the Unit. The exclusive remedy for this warranty is limited to the repair or replacement, at APi's sole option, of any part or parts of the Unit that are returned to APi or to the authorized dealer or distributor of APi from whom the unit was purchased with all transportation charges prepaid, and which, on APi's examination, shall, conclusively appear to have been defective. This warranty does not:

- a. extend to any Unit, or part thereof, that was subjected to misuse, neglect, or accident by other than APi after its delivery to the original purchaser;
- b. extend to any Unit, or part thereof, that was modified, altered, incorrectly wired or improperly installed by anyone other than APi or used in violation of the instructions provided by APi;
- c. extend to a Unit which has been repaired or altered by anyone other than APi or authorized dealer/distributor;
- d. extend to a Unit which has had the serial number removed, defaced or otherwise altered;
- e. extend to plastic or glass windows, lamps, fluorescent tubes and water contact parts;
- f. extend to any unit used outdoors
- g. extend to accessories used with the Unit that were manufactured by some person or entity other than APi.

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APi reserves the right to make any changes or improvements in its products without notice and without obligation, and without being required to make corresponding changes or improvements in Unit theretofore manufactured or sold.



Should you have any questions pertaining to this manual or the vendor, please contact your APi distributor or write directly to:

Technical Services Dept.
Automatic Products int'l
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St Paul Minnesota 55107 USA

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This manual provides detailed information regarding the unpacking, setup, installation, and programming and operation of the Automatic Products international 748 Showcase cold food merchandiser. Please read and understand the contents of this manual before attempting to setup and install the machine.


HOW TO USE THIS MANUAL

This manual is divided into four basic parts:


1. Unpacking and installation.
2. Components.
3. Optional Equipment
4. Quick Set up Guide.
5. Troubleshooting.



CAUTION: This machine is designed for indoor usage only. Any other usage may void the Manufacturers Warranty.



CAUTION: Certain procedures in both the operating section and the service section require that voltage be on in the machine. Only trained personnel should perform this function. Exercise extreme caution while performing these procedures. These procedures will be marked with the lightening bolt symbol as it appears at left.



CAUTION: Certain procedures in both the operating section and the service section requires a qualified trained technician to perform the particular task at hand. These procedures will be marked with the exclamation symbol as it appears at left.

Explanation of Serial Number

7	4	8	0	3	3	6	5	0	0	1
↑			↑		↑			↑		
			Year 03 – Last two digits of the year.		Numerical day of the year – Jan 1 st = 001, Dec 31 = 365.			Sequential build number Starts at 001 every day.		

First digits indicates model, example shown is a 748 Showcase Merchandiser – The machine identification may contain up to six characters dependent upon the model.

Prefixes
E – Indicates a machine built specifically for export outside of North America.


Section 1: Installation

INTRODUCTION

This section contains instructions for unpacking the APi 748 Showcase® Merchandiser and installing it on location. It is important for ease of service, reliability, and safety that you install the machine properly.

UNPACKING INSTRUCTIONS

The APi 748 is shipped in one carton with all major assemblies in place, ready for installation. The shipping carton should be opened carefully to prevent the 748 from being scratched or damaged. Inspect the exterior and interior of the cabinet for evidence of damage. If evidence of damage exists, notify the delivering carrier at once to examine the 748 regardless of the external condition of the carton. Under U.S. regulations, damage claims must be collected from the consignee. Do not return shipping-damaged merchandise until after your claim has been established. Once your claim has been established, damaged merchandise may be returned to an authorized distributor for repair. The invoice for repair charges may then be collected from the carrier. Do not destroy packing material or boxes until the carrier's agent has examined them.



CAUTION! Pushing or sliding the 748 (by hand) on the floor can result in considerable damage to the machine and/or personal injury. Always use appropriate material handling equipment and adequate protective padding to protect the 748.

SETUP INSTRUCTIONS

1. Place the unit in a well-ventilated location with a minimum of SIX INCHES between the 748 and a back wall.
2. Remove all tape and packing material from the cabinet.
3. The 748 must be leveled. Perform level adjustment by using the following illustration: Place level in the (A) position and adjust the bottom leg levelers. Perform same on position (B) then (C).

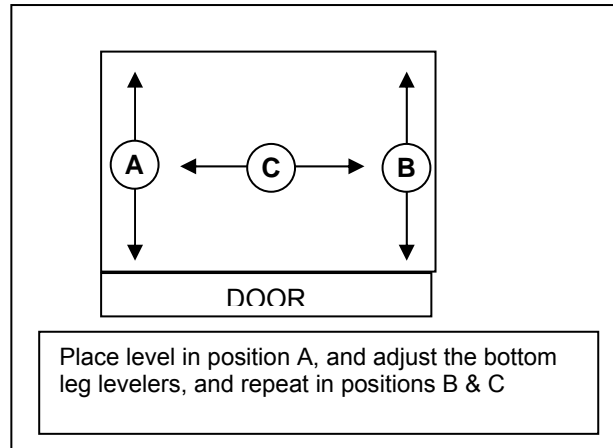



Figure 1-1. Level Adjustment



CAUTION! If the 748 is not leveled correctly the refrigerator evaporator may ice up, causing the unit to shut down.

4. Ensure that circuit breakers are firmly in place and the fluorescent lamps are secure in their sockets.
5. Ensure that the Main Power Switch is in the OFF position.
6. Plug the line cord into a dedicated, properly grounded receptacle capable of delivering the required power.



CAUTION – DO NOT DEFEAT THE SAFETY GROUND

7. Install a supported coin changer (see chart below).
 - a) Check coin chute alignment
 - b) Check coin return lever operation
 - c) Adjust if necessary
8. Install a bill acceptor if desired. Note: If you use a MDB coin mech, you must use a MDB bill acceptor or card reader. (See chart below).
9. If using FIFO mode, insert the selection number labels in the corresponding Delivery Doors. From top to bottom, the door numbering convention is: 01, 02, 03, 04, 11, 12, 13, 14, 21, 22, 23. You only need to label those shelves you intend to operate in the FIFO mode.
10. Check and ensure that all electrical connections are seated properly, especially at the circuit boards.

11. Turn the Main Power Switch ON (leaving Coin Compartment and Main Doors open).
12. At power-up the following sequence of displays should occur:
 - a) The Column Price Displays will show from top to bottom:
 - "11111" "99.95"
 - "22222" "99.95"
 - "33333" "99.95"
 - "44444" "99.95"
 - "55555" "99.95"
 - "66666" "99.95"
 - "77777" "99.95"
 - "88888" "99.95"
 - "99999" "99.95"
 - "AAAAA" "99.95"
 - "BBBBB" "99.95"

Note: After you've set the prices, the actual prices will be displayed.

- b) The Message Center should display:
 - 1) "748 DISPLAY Vx.xx" (x.xx=version of Message Center software), then
 - 2) "API INTERNATIONAL", then
 - 3) "SHOWCASE MERCHANDISER"
 - 4) "748 VERSION x.xx" (x.xx=version of 748 Machine Controller) then
 - 5) "ONE MOMENT", then
 - 6) "- - - TURN TILL ZERO - - -", Press [RESET] key on Message Center. Display should change to "- - - MACHINE OK - - -".

*If other messages appear than those listed above, refer to page 3-2 to process those

- messages, then proceed to the next step.
13. Check that all fluorescent lamps are illuminated.
14. Check the Service Switch operation by rotating the turret one full rotation.
15. Close the main door.
16. Ensure that both the LEDs on the 748 Machine Controller are lit.
17. Perform a full initialization to reset the machine to factory default settings.
 - a) Press MODE switch if Display does not read "- - - SERVICE MENU - - -".
 - b) In the Service menu, press [0], [0], [1], [0].
 - c) After each key press the display will show:
 - "- - - DIAGNOSTICS - - -"
 - "FULL INITIALIZATION NO"
 - "FULL INITIALIZATION YES"
 - "-----"

NOTE: The main door must be closed to prevent an error message from occurring.

18. Program the Cash System Type for the type of coin changer and/or bill validator you will be using (see page 3-7 of Section 3).
19. Power the 748 OFF then back ON.
20. Finish setting up the Cash System options (see Section 3).
21. Ensure the RL Tx LED on the Credit Module is flashing. Ensure the STATUS LED on the Credit Module is operating correctly (refer to Credit Module Indicators in Section 4).
22. Set up prices and options (see Section 3).

	Micro Mech 24V 15 pin ²	Pulse Validator 24 V	Executive ³	MDB Coin Mechanism ¹	MDB Bill Validator
Mars	TRC-6010XV VN4010XV	VN2502-U5E VN2512-U5E VFM1-L2-U4C VFM3-L2-U4C	540 560	TRC-6510 TRC-6512 VN-4510	VN2502-U5M VN2512-U5M
CoinCo	9302 LF USD-L701 USQ-L701	BA32SA BA32R		9302-GX, USQ-G701 USO-G703 USQ-L701	BA32SA BA32R
Conlux	USLX-001-01F			USLZ-004-01F CCM 5 G	USLZ-004-01F

Notes:

1. MDB Protocol - Use Harness R-28203401
2. Logic Protocol ("Dumb")
3. Executive Protocol - Use Harness R-28203301

Section 2: Description

INTRODUCTION

The 748 Showcase® Merchandiser has a maximum capacity of 154 items. It is capable of 3-level pricing and 3-level discounts controlled through Event scheduling. Individual selections can be reserved and sold on specific or multiple shifts. The 748 Machine Controller permits individual programming to vend either FIFO (First In/First Out) mode or Shopper mode by shelf. See the sections on Options and Service Mode for instructions on setting prices and various options.

The Message Center uses point-of-sale messages to help customers make purchases while the 748 Machine Controller collects and accumulates audit information.

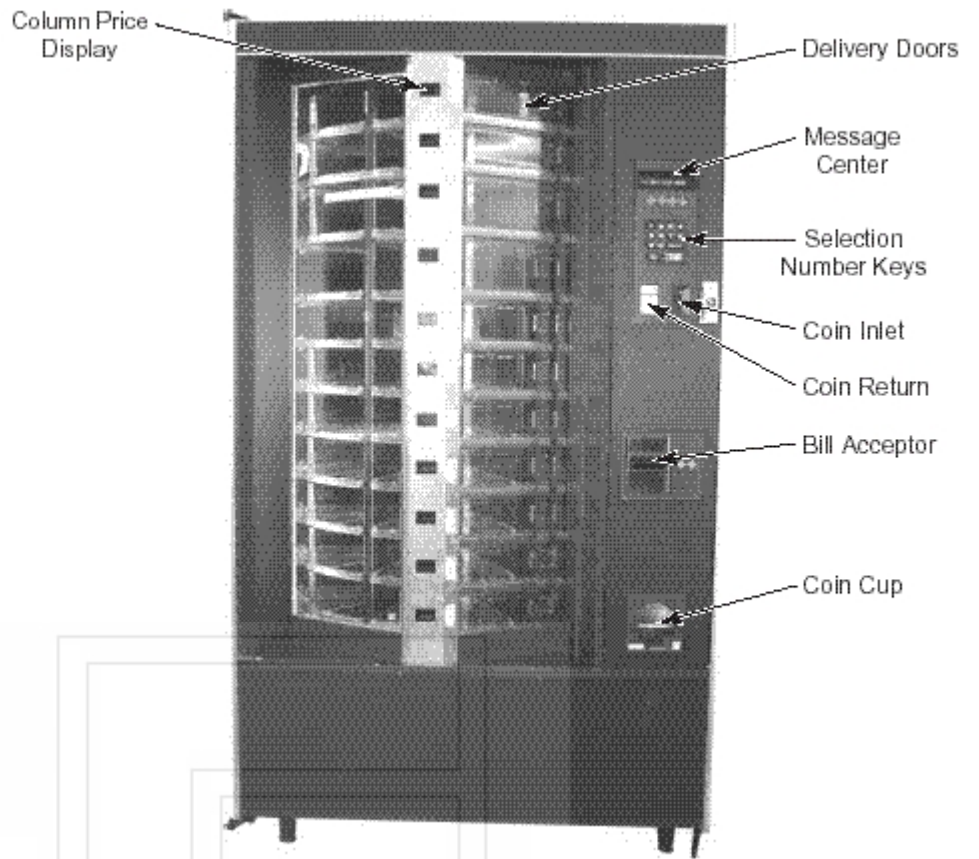
In the event of a system malfunction the 748 Machine Controller saves a history of specific events, temperatures, and error messages which will help to quickly isolate the problem and return the vendor to service.

Hot Keys

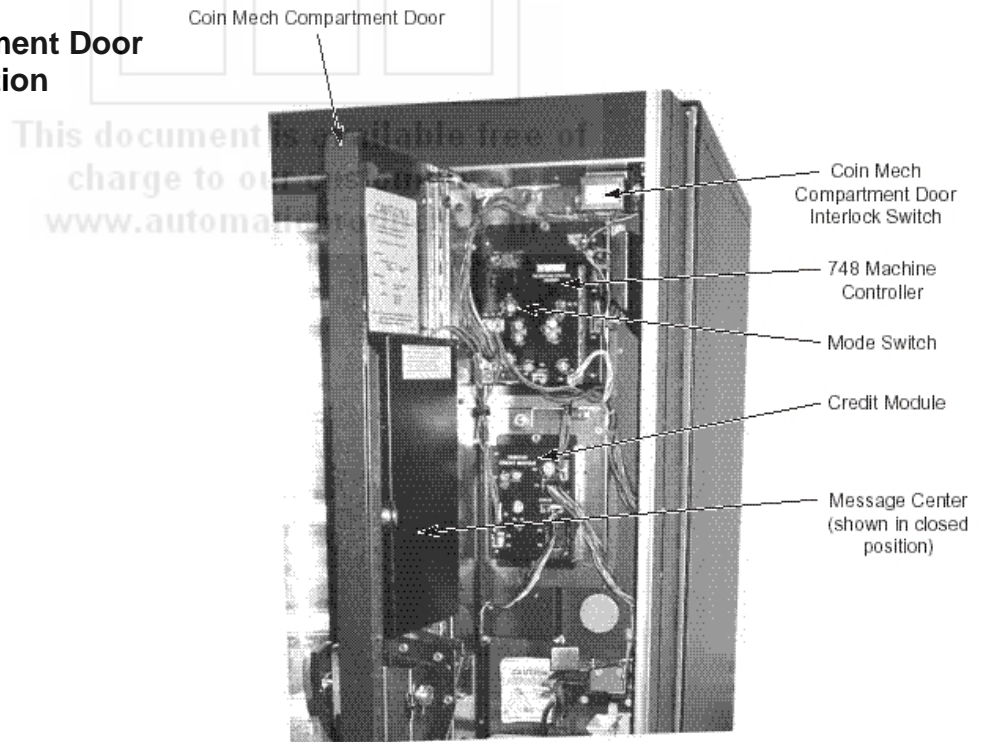
Several hot keys are used to display specific information from the outside of the while the machine is running. A hot key sequence is performed by first pushing and holding the [RESET] key then pushing a number key. Hot keys are defined as:

	Hot Keys	
Reset +	Display Shows	
0	Display machine ID number	MACHINE ID 12345678
1	Display food compartment temperature	TEMP = xxF xxC C
2	Display health control status	HEALTH CONTROL ON
3	Display error time and date (if shutdown)	OFF hh.mm AM mm-dd-yyyy
4	Not used	
5	Display time and day	hh.mm AM DAY
6	Display date	mm-dd-yyyy
7	Not used	
8	Display 748 software version number	CONTROL MODULE xx.xx
9	Display serial number	SERIAL # 12345678

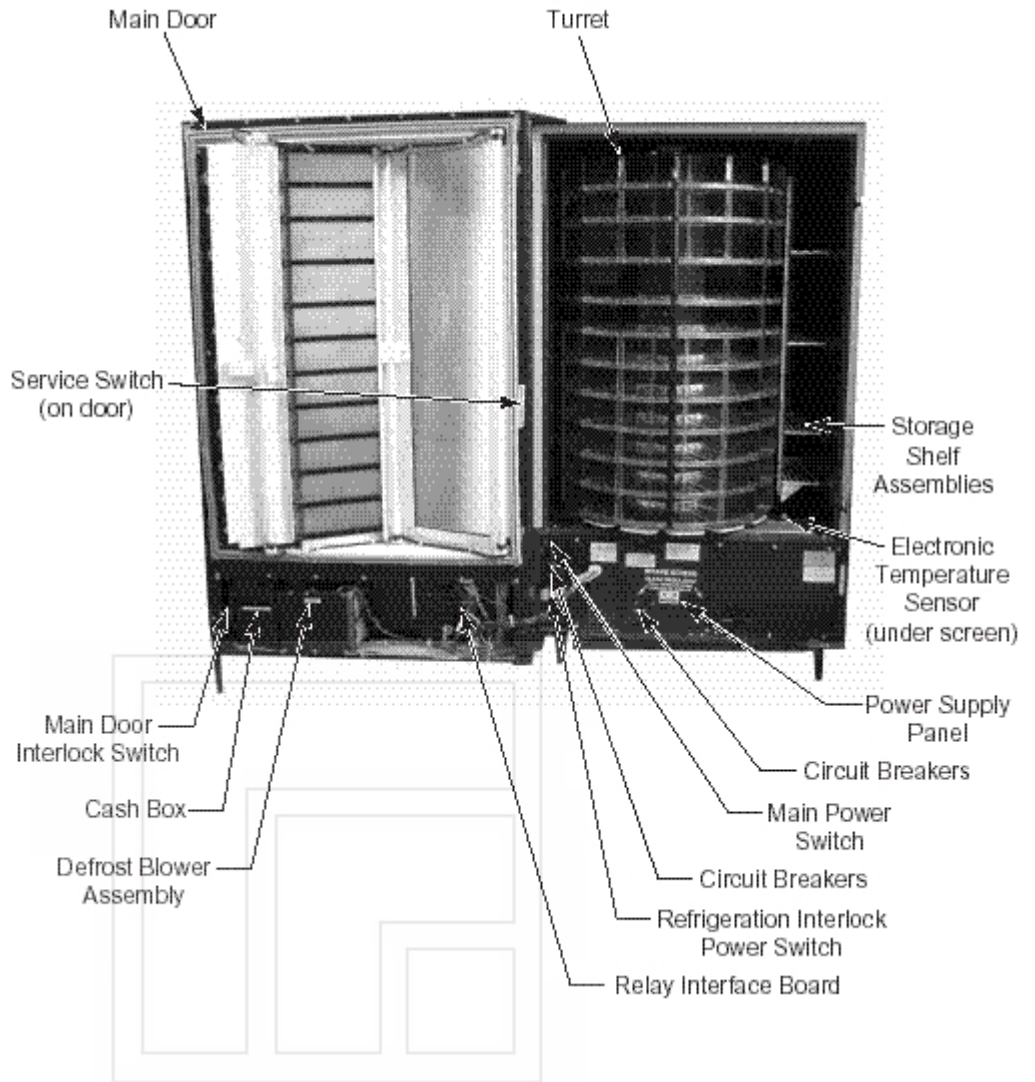
**Figure 2-1:
Front View**



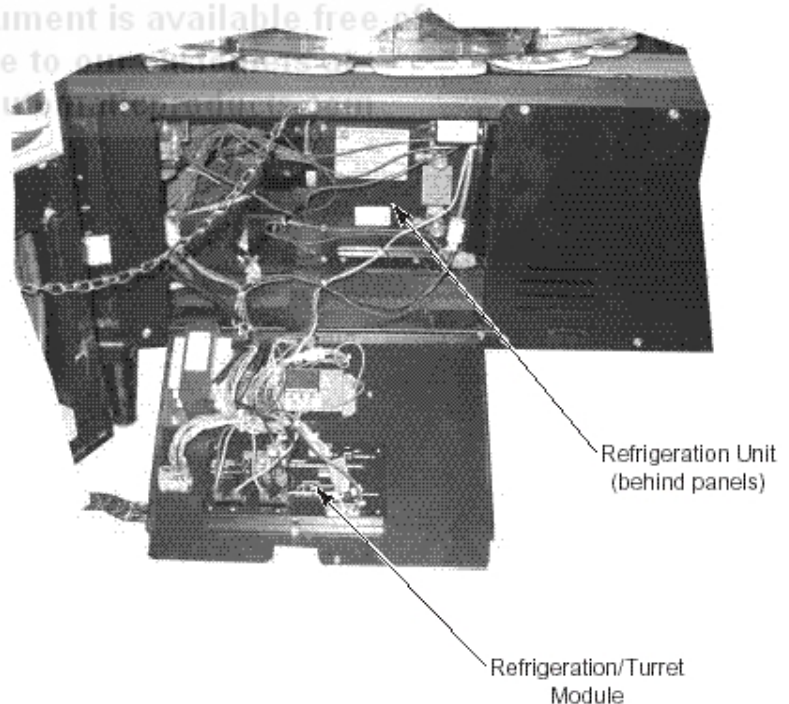
**Figure 2-2:
Coin Mech Compartment Door
Shown in Open Position**



**Figure 2-3:
Main Door
Open View**



**Figure 2-4:
Power Supply Panel
Shown in Open Position**



MAJOR COMPONENTS

748 Machine Controller

The 748 Machine Controller controls and monitors the 748's performance. It also:

- keeps track of real time
- controls the vend process
- monitors food compartment temperatures
- stores prices, option settings, and scheduled events
- records specific events and error messages
- accumulates cash and sales data
- controls the other four major components:
 - Message Center
 - Credit Module
 - Column Price Displays
 - Refrigeration/Turret Module

Message Center

The Message Center contains a 20-character vacuum fluorescent display for customer messages and prompts, turret rotation keys, and selection number keys. The selection number keys are also used in Service Mode to perform service mode functions.

Credit Module

The Credit Module will interface the 748 Machine Controller to various credit devices including coin changers, bill validators, and card readers. It can support several different credit device interfaces including pulse, serial, MDB, and Protocol A.

Column Price Displays

The Column Price Displays are the five-digit vacuum fluorescent displays down the center column of the machine. These displays will show pricing and status of selection compartments.

Refrigeration/Turret Module

The Refrigeration/Turret Module controls the modular refrigeration unit in the 748 and reports the temperature to the 748 Machine Controller. It also drives and monitors the turret motor and half cycle switch as commanded by the Machine Controller.

Main Power Switch Assembly

This assembly is located in the bottom left corner of the cabinet. It houses the Main Power ON/OFF switch along with the Refrigeration Interlock Power Switch, a switch which opens the refrigeration circuit to prevent frost buildup whenever the main door is open. It also contains two circuit breakers to protect the machine from an overload.

Service Switch

This switch is located along the inside edge, on the hinge side of the Main Door. It is a momentary rocker switch that can be used to rotate the turret when cleaning or filling the machine with product.

Main Door Interlock Switch

This switch is located on the inside of the main door near the cash box. It will open when the main door is open or ajar. This switch must be closed when the coin mech compartment door is closed to prevent an error.

Storage Shelf Assemblies

A four-shelf storage rack is located along the right wall of the cabinet. This rack is intended to store nonperishable pre-cooled products to be used at the next servicing.

Turret

The turret can be rotated in both directions using the turret rotate keys on the Message Center. At each subsequent power up, the turret automatically rotates until the 748 Machine Controller senses that the turret is at the "home" position. If the turret is already "home" or any door is open (delivery, main or coin mech compartment), it will not rotate on power up.

Electronic Digital Thermometer

The electronic temperature sensor is located in the return air compartment of the evaporator under the evaporator screen. The temperature sensor is used to monitor the temperature of the cabinet interior (food compartment) by the Refrigeration/Turret Module, which in turn, controls the refrigeration unit and reports the temperature to the 748 Machine Controller. The Machine Controller uses the reported temperature to run the Health Control feature. Should the Refrigeration/Turret Board fail, the temperature is controlled by manual thermostat located on the air return plenum of the refrigeration unit.

To read the interior cabinet temperature while the machine is running in the vend mode, push **HOT KEY 1** (push and hold the [RESET] button then push the [1] button).

See page 2.1 for a description of all Hot Keys.

Relay Interface Board

Located on the inner front door near the lower hinge, this board contains the energy control relay for the door heaters, the turret motor interlock relay, and the lights relay. It also provides rectified 24VDC for coin mechanisms and rectified and filtered 24VDC used to power all of the logic boards.

Delivery Door Defrost Blower

To prevent fogging in high humidity environments, a defrost blower and heater system is provided (see *Figure 2-3*). This blower can be switched off in low humidity environments to save on energy consumption.

Energy Control

The heating element in the Defrost Blower unit is controlled by the Energy Control Relay and is switched off whenever the refrigeration compressor is on. The electric heater for the frame of the heated glass window is also controlled in the same manner. This system provides adequate protection against window/delivery door fogging, and at the same time reduces energy consumption.

REFRIGERATION

Electrical

The self-contained refrigeration system is designed to slide in and out of the 748 as one complete assembly. A normal 3-pin AC power cord supplies power to the refrigeration system. The evaporator blower runs continuously while AC power is applied, regardless of the temperature in the food compartment. The condenser fan runs only when the compressor is running. The compressor and condenser fan are controlled by a relay on the Refrigeration/Turret Module.

When the main door is opened, the Refrigeration Interlock Power Switch opens, turning off power to the refrigeration system. When the main door is closed, the evaporator blower starts immediately, but there is a one-minute time delay before the condenser fan and compressor will be turned on. This delay reduces high torque starting of the compressor due to rapid ON/OFF cycling.

Electronic Temperature Sensor

As described above, the temperature sensor is located in the return air compartment of the evaporator under the evaporator screen.

NOTE: The compressor control processing is controlled by the Refrigeration/Turret Module and is independent of the health control processing which the 748 Machine Controller handles. If the 748 goes out of service, the compressor control processing will continue to operate.

The temperature sensor is a solid-state temperature transducer. This temperature sensor converts

temperature to voltage, which is monitored by the Refrigeration/Turret Module. The temperature is transferred to the 748 Machine Controller where it is used for Health Control processing.

Compressor Algorithm

The compressor will turn on one minute after closing the main door and will stay on for 20 minutes or until the food compartment temperature falls below the low temperature range setting. If the temperature does not reach the low setting within 20 minutes, the compressor will turn off for two minutes then turn back on for another 20-minute period. This 20-minute on, two-minute off cycle will continue until the food compartment temperature falls below the low temperature range setting.

Once the temperature in the food compartment falls below the low temperature range setting, the compressor will turn off for at least three minutes. After three minutes, if the temperature rises above the high temperature range setting, the compressor will turn on for no more than 30 minutes.

Health Control

After opening and closing the main door, the machine has 30 minutes in which to bring the cabinet interior (food compartment) temperature below the maximum temperature range setting. If the temperature is still above the maximum temperature setting, a 15-minute grace period begins. If this grace period finishes and the temperature is still above the maximum temperature range, the machine will go out of service.

To display the amount of time remaining in the pull down period, press hot key 2. "HEALTH DELAY XX MIN" will appear on the display, where XX is the number of minutes remaining from the original 30-minute limit.

After the 30-minute pull down period expires or the food compartment temperature reaches 41°F, pressing hot key 2 will display "HEALTH CONTROL ON". This indicates that the food compartment temperature is being monitored per Section 700 of the NAMA Construction Standard for Refrigerated Food Vending Machines.

If the machine should exceed the NAMA food compartment temperature requirements, it will shut down with a "HEALTH TIME OUT" error. To reset a "HEALTH TIME OUT" error, you must first clear the error then open and close the main door.

OPERATION

Normal 748 machine operation will find the 748 food compartment within the storage temperature range, fluorescent lamps lit, all delivery doors locked, column price displays showing the prices of each adjacent compartment, and the Message Center scrolling the point-of-sale message.

Point-of-Sale Messages

The Message Center will display several messages to the customer during the vend process. Each possible message is described below.

INSERT MONEY - MAKE SELECTION - This is the default point-of-sale message. This message will scroll across the Message Center display while waiting for a customer to insert money. This message may be changed in the service mode.

USE COINS ONLY - This message will appear when the coin changer is too low on coin tube coins to make change for bills but there is sufficient change to give change for coins.

USE EXACT COINS ONLY - This message will appear when the coin changer is low on the smallest-valued coin tube coin.

MAKE FREE SELECTION - The 748 is set to free vend. No money is required or token vend is made with token option set to "FREE ANY" (see *Token Options in Section 3*).

MACHINE SHUTDOWN UNTIL hh.mm - This message is displayed whenever the machine has been shutdown due to event scheduling (the Timed-Lockout feature). hh.mm is the time the machine will return to normal operation.

SORRY OUT OF SERVICE - This message will appear when there is an error condition detected in the 748. Money acceptance is inhibited and the fluorescent lamps are turned off.

CREDIT x.xx - This message shows the customer how much credit has been established on the machine.

CHANGE x.xx - This message shows the amount of change that is being returned to the customer.

THANK YOU - Displayed after a customer makes a selection.

NOT ENOUGH CREDIT - This message is displayed when a customer tries to make a purchase but has not inserted enough money.

ITEM ALREADY SOLD - This message is displayed when a customer tries to purchase a selection that has already been sold.

ITEM IS NOT AT DOOR - This message is displayed when a customer attempts to purchase a selection on a full width compartment and the turret is in a half compartment position.

CLOSE ALL DOORS - This message will be displayed when more than one delivery door is opened at the same time.

CLOSE DOOR xx - This message is displayed when a customer tries to rotate the turret when one delivery door is not closed.

SELECTIONS SOLD OUT - This message is displayed when the token option is set to "PRODUCT CODE" and a token is inserted with no selections available within the programmed product code range.

WINNER - This message is displayed when the free vend odds option is turned on and a customer makes a selection and wins a free vend.

RESERVED SELECTION - This message is displayed when the Sell By Shift option is active and a customer attempts to buy an item that is reserved for another shift or purchase an item that is reserved for token purchase only.

VALIDATING CARD - This message will appear when a customer attempts to purchase a selection using a card in a card reader.

MAKE SELECTION - This message will be seen when a token vend is made with the token option set to "PRODUCT CODE" (see *Token Options in Section 3*).

NO CHANGE - This message will be displayed when a large bill is inserted into the bill validator and there is not enough change in the coin changer to make change. The bill will be returned to the customer.

PRESS SELECTION xx - This message is displayed when a customer attempts to make a selection on a shelf set to FIFO (first-in-first-out)

mode and the turret is not positioned at the first in product. The customer must select xx using the keypad.

SELECTING SHELF xx - This message is displayed after the first digit of a FIFO selection has been made.

ONE MOMENT - This message is displayed while the turret is rotating into position after a FIFO selection has been made. This message will also be displayed after closing the coin changer compartment door while leaving the Service Mode.

SHELF NOW READY - This message is displayed during a FIFO purchase after the turret has moved into the vend position.

Price Column Displays

The price column displays will show the status of each compartment as the turret is rotated and during purchases. The different status messages that can be seen on the price column displays are discussed below.

nn.nn - This indicates the price of the item in a compartment. (n = any digit 0 - 9)

SoLd - This indicates the item in a compartment has already been sold.

OPEn - This indicates the door to this compartment is unlocked and the item can be removed.

- - - - This indicates that the turret is not lined up with the delivery door or that this item is reserved for another shift.

[] This is displayed on each compartment that has been sold during the Sold Out Check operation.

] - - - [This is displayed on each sold compartment that has been cleared during Sold Out Check operation.

AVAIL - This indicates which items are available for purchase when a token is inserted into the bill acceptor and tokens are not set up as a cash value.

(See *Token Options in Section 3.*)

PROGRAMMABLE OPTIONS

The 748 has several programmable options. Some options can simply be turned on or off, where other options can be scheduled to turn on or off at programmed times. Below is a summary list of the options available in the 748. Settings listed in **bold** are the default settings. Further in this section are descriptions of each option, what it does, and how to set it up. See *Section 3* for specific key commands to set specific option parameters.

<u>OPTIONS</u>	<u>POSSIBLE SETTINGS</u>
• Free Vend	On or Off
• Sold Out Check	On or Off
• Force Vend	On or Off
• Random Free Vend	xxx:1 or Off
• Shutdown	On, Off or PER SCH
• Multiview	On, Off or PER SCH
• Discount	Off or PER SCH
• Sell by Shift	Off or PER SCH
• Pricing	Normal or PER SCH
• Show Sold	Off or On

OPTIONS EXPLAINED:

Free Vend

The Free Vend option will simply show all prices at 0.00 and allow items to be vended without credit. Normally, communication with a coin mech is required or the 748 will shutdown; however, with Free Vend turned on, the coin mech is ignored.

Sold Out Check

This option is used to help determine whether a compartment has been refilled with possibly tampered food. This option may be bypassed by pushing the [RESET] key.

Force Vend

This option is designed to force a purchase after bills and/or coins are deposited into the 748. Any attempt to return credit using the coin return will be refused. Change will be returned only after a purchase is made.

Random Free Vend

Random Free Vend is intended to free vend a selection on a random basis using a pre-selected occurrence level. The FREE VND ODDS item in the service mode can be programmed OFF or any range of odds from 50:1 to 3000:1 in steps of 50. This option sets the odds of winning, so setting 50:1 odds does not guarantee one winner every 50 vends. However, after several thousand vends, the average number of free vends will be 50:1.

Shutdown and Timed Lockout

The Shutdown option can also be set to ON. This will cause the 748 to immediately go into shutdown when the coin door is closed. To restore the machine to vend mode, the coin door must be opened and the Shutdown option must be turned OFF. This can be used to prevent sales or turret activity when service activities are in process.

The 748 supports a TIMED LOCKOUT feature which may be programmed to prohibit sales at specified times during the week using a scheduled event.

When the 748 is shutdown due to such a scheduled event, the machine lights will be off and a message will be displayed on the message center showing "MACHINE SHUTDOWN UNTIL xx.yy", where xx.yy is the time when the machine will go back into service. During programmed shutdown, the refrigeration and health control systems continue to work normally.

The shutdown option must be set to "PER SCH" and a shutdown event must be programmed in the event schedule.

Multiview

When Multiview is turned on, the turret is rotated three positions every three minutes of idle time. Multiview is used to draw attention to the 748 and to periodically move the food in the refrigerated compartment to provide more uniform temperature control.

Multiview can be turned on or off or can be scheduled to turn on and off at specified times of the day using a scheduled event.

EXCEPTION: If the operating temperature range is set for 1°C - 3°C, the multiview option *cannot* be disabled or turned off.

Discount

Three different discounts may be programmed. Discount amounts will be subtracted from the regular price whenever that discount becomes active. The prices on the price display will reflect any active discount. If the discount amount is greater than the price of a selection, the price of that selection will be 0.00. To use discounts, the Discount option must be set to "PER SCH", a discount amount must be set, and a discount event for that discount must be programmed in the event schedule.

For example: Discount 1 is set to \$0.10 and a scheduled event turns on Discount 1 on Friday at 17:00 then off on Saturday at 22:00. All displayed on the price display between those times will have \$0.10 subtracted from them.

Sell By Shift

Sell By Shift allows reserving selections for sale at a specific time. Each compartment can be individually reserved for sale on specific days of the week and hours of the day.

When someone tries to open the door to a selection that is reserved for a nonactive shift, the display will show "RESERVED SELECTION".

Pricing

Three different prices (price schedules) may be set for each selection compartment. If the pricing option is set to "NORMAL", only price schedule 1 is used. If the pricing option is set to "PER SCH", then the pricing schedule can be programmed using scheduled events. Any time not defined by a specific schedule will default to price schedule 1.

Show Sold

With this option ON, when a "sold" compartment is in the vend position, its corresponding price display will show "SoLD" instead of the item's price. With the option set to OFF, prices will be shown for all compartments in the vend position even if the item has been sold.

SCHEDULED EVENTS

Up to 25 scheduled events may be programmed into the 748. A scheduled event is an option that is turned on and off based on time of day and the day of the week. The options that may be programmed as events are:

- SHUTDOWN
- MULTIVIEW
- SHIFT 1
- SHIFT 2
- SHIFT 3
- PRICE 1
- PRICE 2
- PRICE 3
- DISCOUNT 1
- DISCOUNT 2
- DISCOUNT 3

Day of the week selections include:

MON - Monday
TUE - Tuesday
WED - Wednesday
THU - Thursday
FRI - Friday
SAT - Saturday
SUN - Sunday
WKD - Week days (Monday - Friday)
ALL - Everyday

An event is any scheduled change in an option. For example, Multiview may be scheduled to turn on at 17:00 and turn off at 8:00 Monday through Friday. This would be considered one event, even though Multiview will be turned on and off each day, Monday through Friday.

To get an option to turn on and off based on a schedule; two things must be set up. First, set the option to "PER SCH". Second, program the event in the event schedule.

When programming an event in the schedule, the event type, on time, and off time must be set. On times and off times can be set to occur on the same day (on at 8:00 Monday, off at 16:00 Monday), on subsequent days (on at 8:00 Monday, off at 17:00 Friday), on every day of the week, or on just Monday through Friday.

FIFO Vend Mode

The 748 can be set up to vend items on a shelf in a First-In-First-Out (FIFO) mode. This is a way to ensure the oldest product on a shelf is purchased first. Each shelf can be individually set to operate in the FIFO mode. If not in the FIFO mode, a shelf will be in the normal shopper (SHOP) mode.

Each shelf is assigned a two-digit shelf number. This number is used when making a purchase on a FIFO shelf. Normally, the customer just opens the delivery door of the selection they want. FIFO requires the sale of the oldest product first so the customer cannot just open any door. If the oldest product happens to be in the right place, the door will open. Otherwise, a message on the display will read "PRESS SELECTION xx" where xx is the shelf number. When the customer enters shelf number xx on the keypad, the 748 will rotate to present the oldest product on that shelf and allow the customer to make the purchase.

As the customer is entering the shelf number, the display will show "SELECTING SHELF x" when the 1st digit is pressed. Then, the display will show "ONE MOMENT" as the turret rotates into position. Then finally the display will show "SHELF NOW READY", indicating the product is in position to be purchased.

Be sure to insert the shelf number labels into the label holder on the back of the Delivery Doors so customers know the shelf number to select.

To reset the FIFO index for a shelf, use Service Mode function [3][3] and re-configure the shelf as a FIFO shelf. This will reset the index for that shelf to the first vend position (home position on the turret).

FIFO MODE OPERATION

Start Point, Full Shelf

After initialization, items are sold in **sequential** order as shown here. On subsequent refills, the actual position of the item to be sold next depends solely on the last item sold. The next item sold is always immediately to the left of the previously sold item.

After items are sold and you return to refill the machine, a typical FIFO shelf *might* look like this. If not, use Service Switch to rotate the turret until the remaining products are positioned as shown.

The next product to load here is at Position 1. The rule to follow is use the Service Switch to rotate the turret until the last remaining product is on your right, and then reload the shelf from right to left.

The selling sequence after loading this shelf would be 12, 13, 14, 1, 2, etc.

Special Situations

The first special situation is when you find one or more completely sold out FIFO shelves. If you can fill every selection, there is no problem. If you do not have enough product to fill every location, you won't know where to begin loading.

If you have the "CHECK SOLD OUT" option ON (Options Menu), you will be prompted to do so when the coin door is opened. If so, check all the SOLD compartments (or press [RESET] to skip this check). Once the Display shows "- - - MACHINE OK - - -", turn the turret to the zero position. Pressing the MODE switch will change the display to "- - - SERVICE MENU - - -". Then pressing [3][3] will cause the display to read "- - - PRICES - SHELVES - - -", then "SHELF MODE xxx", where xxx is FIFO or SHOP. If necessary, use [1] to toggle to FIFO, then actuate the delivery door of each of the completely sold out shelves. This will reset the shelf so that the first item sold will be that at Position 1. Begin filling the empty FIFO shelves in sequence - 1, 2, 3, 4, etc. as the arrow to the left describes.

If for any reason you cannot completely fill a FIFO shelf, you can eliminate the possibility that a customer will open an empty selection ("buy air") by using the "SET FIRST EMPTIES" feature.

To use this feature, the "CHECK SOLD OUT" option must be ON.

When the "CHECK SOLD OUT" option is ON and the Main Door is closed after filling the machine,

the Display will show "SET FIRST EMPTIES". For every partially filled FIFO shelf, rotate the turret until the last available product is just to the right of the Vend position. With the first empty compartment at the vend position, actuate the corresponding delivery door. The computer will then mark the compartments from there to the next-to-sell product as being Previously Sold. In the example at the left, compartments 9 through 14 would be marked as Sold.

Filling the Machine

In order to prevent the sale of an item replaced in the machine by a customer, the 748 keeps track of the compartments that have been sold and prevents those doors from being opened again before you open the machine and fill it. Because of this, the machine must be aware that you've filled the machine.

If you open the coin compartment door and then open the Main Door and press the Service Switch without first pressing the MODE switch on the Main Controller, the 748 will assume that the machine is being filled and as such will reset all compartments to the unsold state.

Pressing the MODE switch on the Main Controller before operating the Service Switch will cause the 748 to assume that there is a service call in process, and it will allow turret rotation without affecting the sold state of any of the compartments.

This process is the same for all shelves whether in Shopper Mode or FIFO mode. Shelves that are in FIFO mode will resume sales from the previous point, so you still have true FIFO operation even after filling.

Section 3: Service Mode

Introduction

The 748 uses a menu driven interface to set up the machine, retrieve audit information, and troubleshooting assistance.

Opening the Outer Door (Monetary Door)

Opening the Coin Compartment Door will put the machine in service mode. This will prompt the display to change to one of the following messages:

“ - - - MACHINE OK - - - ”
“ - - - ERRORS EXIST - - - ”
“CHECK HISTORY LOG”
“TURN TILL ZERO POSITION”
“CHECK SOLD OUT DOORS”

“ - - - MACHINE OK - - - ”

The machine is operating normally, Press MODE switch on the Machine Control Board, the Display will change to “ - - - SERVICE MENU - - - ”. In this mode you can set up the machine options and retrieve sales information (see page 3.X).

“ - - - ERRORS EXIST - - - ”

If the machine is out of service, the Display will prompt “ - - - ERRORS EXIST - - - ”. Pressing the MODE switch on the Main Control Board will cause the Display to change to the error description. Pressing the “RESET” key will cause the Display to change to “CLEAR ERRORS NO” unless a Health Timeout Error occurred after the original error. If this happened, the Display will show “HEALTH TIME OUT” and you must press the [RESET] button a second time to reach the “CLEAR ERRORS NO” message. To clear the error(s) press the [1] key to change from “NO” to “YES” and then press the [0] key (the Display will show “ERRORS CLEARED” and then proceed to the next applicable message). You may proceed to the next applicable message without clearing the errors if desired by pressing the [RESET] key. Note: Errors are not cleared until the Service Mode has been exited by closing the Coin Compartment Door. Errors will not be cleared if the power is lost before re-entering Vend Mode.

A Health Timeout Error will not be cleared unless you open the Main Door. This action lets the computer system “know” that you have examined the food and taken any necessary steps to insure that it is safe for consumption.

Since the Control Board continues to monitor all systems even while it is out of service, other errors may have occurred during the downtime. To be certain that there are no other problems in

the machine, always check the Error History before putting the machine back into service.

Refer to Section 4: *Troubleshooting* to help resolve any reported errors. There is an error log that will retain the last 20 errors that occurred. Refer to “History” in the Section 4: *Troubleshooting* to view and/or print the error history.

CHECK HISTORY LOG

If a non-shutdown event (such as a bill jam) occurred since the last servicing, “CHECK HISTORY LOG” will be displayed. If from a preceding error condition, press [RESET] to continue. Otherwise, press the MODE Switch to continue. It is recommended that the History Log be checked for non-shutdown events upon entering the service menu. See *KEY [4] - History* in this section.

TURN TILL ZERO

This message is displayed when the Turret Position has not been initiated. To initiate the Turret Position, rotate the turret using the Turret Keys until “ZERO POS FOUND” is displayed on Message Center. At this time the Center Price Display will be updated to reflect current pricing and the Sold display is updated. Turn Till Zero function may be aborted by pressing the [RESET] key. In this case, some functions in service mode, including pricing can not be accessed until the Zero Pos has been found.

CHECK SOLD OUT DOORS

The Check Sold Out Doors feature is used to verify that a compartment has not been refilled with potentially tampered food or other objects.

When this option is ON, the display will show “CHECK SOLD OUT DOORS”. The price display at each delivery door will show “[]” if that compartment should be empty. Open each compartment door and remove anything that might be in the compartment (tampered food, trash, etc.): the display will change to “[] --- []”. Rotate the turret and check all compartments that show “[]”. Once all compartments have been checked, dashes will flash on all price displays and the display will go to the next applicable message.

As an alternate method, you may visually check all of the sold compartments, and then press the [RESET] key or open the Main Door to exit this function.

AP 748 Showcase Operating Modes

HOT KEYS	
Reset +	
0	MACHINE ID NUMBER
1	INTERIOR TEMPERATURE
2	HEALTH CONTROL STATUS
3	ERROR TIME AND DATE
4	NOT USED
5	TIME AND DAY
6	DATE
7	NOT USED
8	SOFTWARE VERSION
9	SERIAL NUMBER

---DIAGNOSTICS---	
00	FULL INITIALIZE
01	TEMPERATURE STATUS
02	TIME OVER HEALTH
03	HEALTH TEST
04	SOFTWARE VERSIONS
05	LOG TO PRINTER OFF
06	DRIVER TEST
07	INPUT TEST
08	
09	

---HISTORY---	
40	
41	VIEW HISTORY LOG
42	VIEW ERROR LOG
43	VIEW TEMP LOG
44	
45	CLEAR HISTORY LOG
46	CLEAR ERROR LOG
47	CLEAR TEMP LOG
48	
49	PRINT LOGS

COIN COMPARTMENT OPEN
PRESS MODE SWITCH TO ACCESS

---OPTIONS---	
20	FREE VEND
21	PRICING
22	DISCOUNT
23	MULTIVIEW
24	SELL BY SHIFT
25	SHUTDOWN
26	SOLD OUT CHECK
27	
28	FORCE VEND
29	FREE VEND ODDS

Menu #	---SERVICE MENU---
0	---DIAGNOSTICS---
1	.xx COIN yy z.zz
2	---OPTIONS---
3	---PRICES - SHELVES---
4	---HISTORY---
5	CASH SYS TYP
6	
7	---SET UP---
8	DISPLAY AUDIT DATA
9	SECURITY CODE

5 - PAYMENT SYSTEMS
MDB ,DUMB or Executive Devices
See Manual for set up details.
NOTE:
After changing any setting, you
MUST power machine OFF
OFF, then ON to properly initialize
the payment peripherals!
**DO NOT MIX MDB, DUMB or
Protocol A Devices**

--PRICES - SHELVES--	
30	
31	SCH PRICE
32	SHELF SIZE
33	SHELF MODE
34	DISCOUNT =
35	PRODUCT CODE
36	SELL ON SHIFT
37	SHOW SOLD
38	
39	

DISPLAY AUDIT DATA
Press [0] key to step through
Display Audit Data. When you
reach the end of the data,
display will show:
CLEAR AUDIT DATA N
Press [1] key to toggle between
Y and N, Press [0] to clear
interval data.

----SET UP---	
70	SET SCHEDULED EVENTS
71	P.O.S. MESSAGE
72	SERIAL#
73	MACHINE ID
74	SET DATE
75	SET TIME
76	TEMP RANGE
77	DATE FORMAT
78	BAUD RATE
79	LANGUAGE ENGLISH

P/N 746000xxx

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ACCESSING SERVICE MENUS

Access to all service menus starts with the Message Center showing “- - - SERVICE MENU - - -”. If the display shows something different, push the [RESET] key to return to the top of the service mode.

Generally, service mode functions have been grouped together based on their function and assigned to a common key. Most service mode functions require two key strokes. The first key selects the group, and the second key selects the specific function.

After entering the one or two keys to display the desired service mode function, the keys are again used to make changes to that function.

The service mode function groups and the keys they are assigned to are:

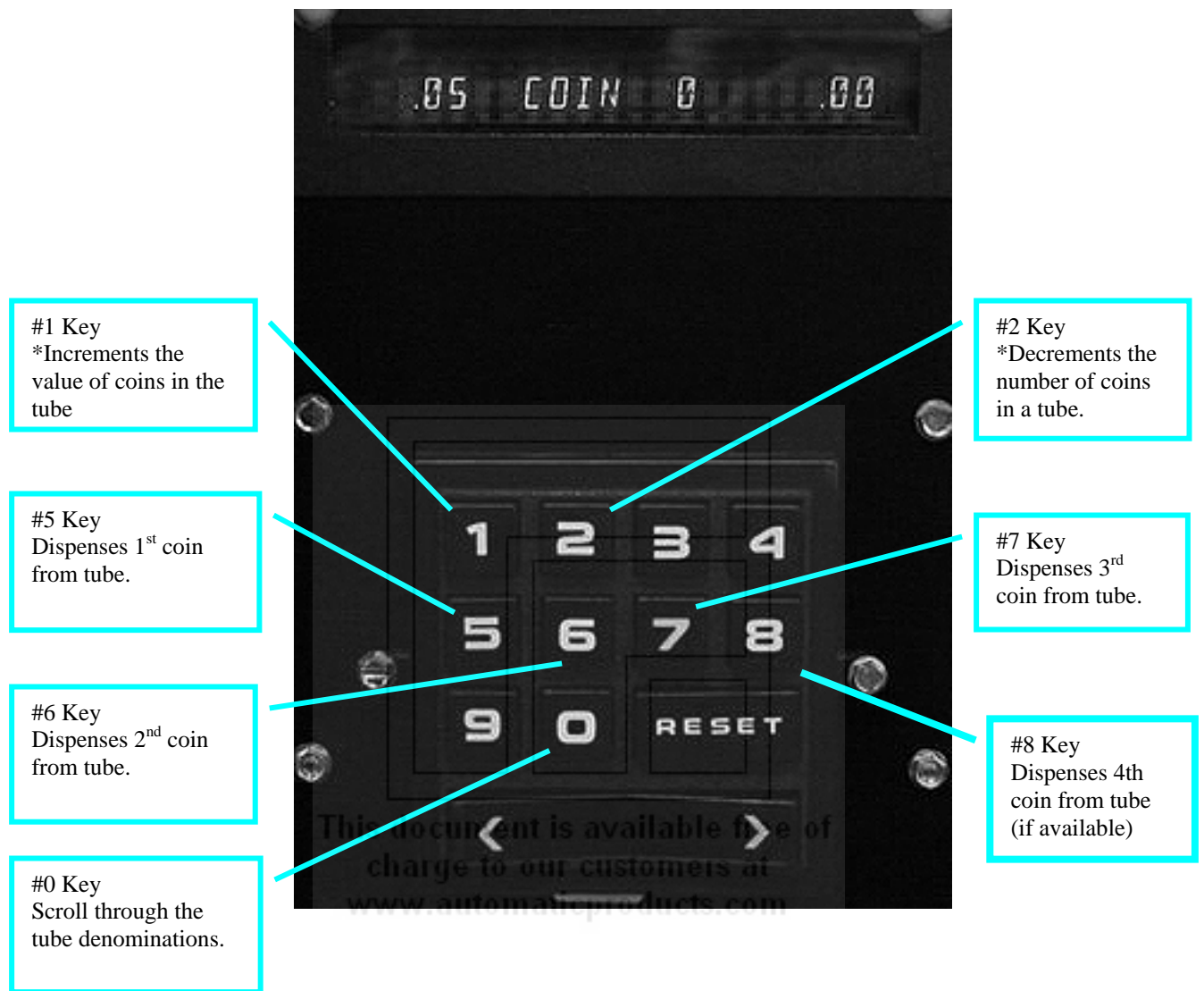
- [1] Load and calibrate coin tubes
- [2] Set up 748 options
- [3] Set prices and shelf parameters
- [4] View and/or print history logs
- [5] Set cash system type and options
- [6] Not used
- [7] Set up 748 machine parameters
- [8] Display/print/download audit data (DEX)
- [9] Security
- [0] Diagnostics

The remainder of this section describes how the keys are used in each service mode function with a quick summary of the function itself. For a more complete description of a specific function, refer to the section where that function's operation is described.



This document is available free of charge to our customers at www.automaticproducts.com

Pressing the [1] Key from “Service” the display will prompt the coin mech inventory.



* Not available if using an MDB coin mech with the tube sensing option set to “Auto”

Pressing the [1] Key from “Service” the display will prompt the coin mech inventory

KEY [1]

Coin Tubes – The purpose of this function is to allow the operator to inventory and adjust the number of coins in the coin tubes. Note: When an MDB coin changer is installed and the TUBES option is set to AUTO, this function will show the number of coins in the tubes but will not allow manual changes. The MDB coin changer keeps track of the number of coins in the tubes and reports the number to the controller. Also, if an Executive type coin changer is installed, the tube counts are not used at all.

If coins are manually added to the tubes from the front of the changer, the coin count must be adjusted in this menu. If coins are deposited or dispensed while in this mode, the display will automatically show the inventory count of the last coin denomination.

DISPLAY: “.xx COIN yy z.zz”

xx is the value of the coins in a tube
yy is the number of coins in this tube
z.zz is the value of all coins in this tube

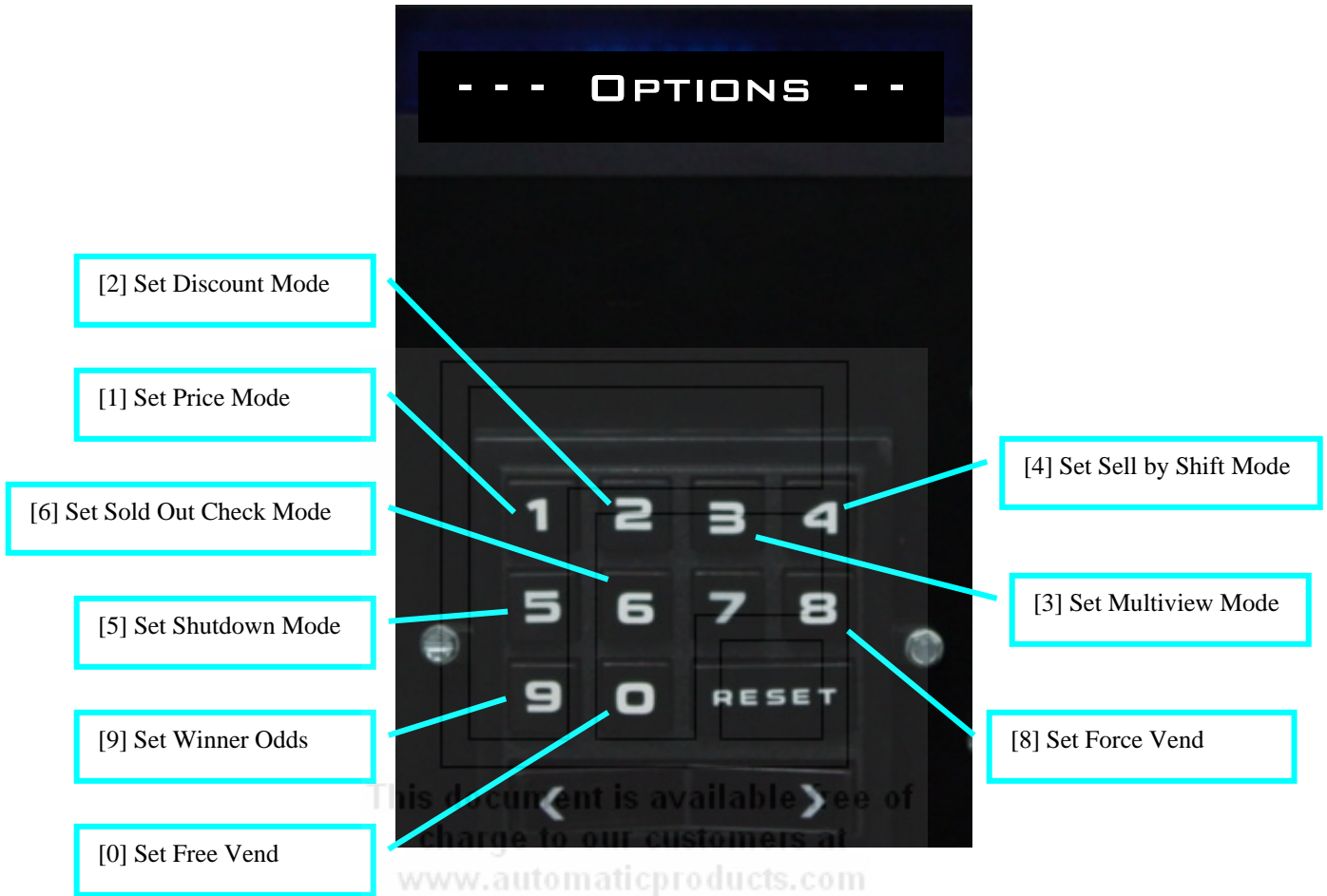
Key Function

- [0] Scrolls through coin tubes
- [1] *Increments the number of coins in a tube
- [2] *Decrements the number of coins in a tube
- [5] Dispenses from 1st coin tube
- [6] Dispenses from 2nd coin tube
- [7] Dispenses from 3rd coin tube
- [8] Dispenses from 4th coin tube (if available)
- [RESET] Returns to the top of the service mode

*Not available if using MDB mech with the TUBE sensing option set to “AUTO”.

When the dumb type coin changer is selected and the TUBE sensing option is set to “LEVEL”, the tube count will automatically be adjusted when the level sensor in the coin changer is covered or uncovered and the coin tube counts will revert to their default values.

Pressing the [2] Key from “Service” the display will prompt Options



Pressing the [2] Key from “Service” the display will prompt Options

KEY [2]

Options – This menu allows you to set the the options available on the 748. Each function in this service menu requires a two-key entry to run; the first key is [2], and the second key is one of the following:

- [1] Set pricing mode
- [2] Set discount mode
- [3] Set multiview mode
- [4] Set sell by shift mode
- [5] Set shutdown mode
- [6] Set sold out check mode
- [7] Not used
- [8] Set force vend mode
- [9] Set winner vend odds
- [0] Set free vend mode

Free Vend [2][0]

When this option is turned on, the machine will vend for free.

DISPLAY: “**FREE VEND NO**”

- [1] Toggles between YES and NO
- [0] Saves choice and returns to the top of the service mode
- [RESET] Returns to the top of the service mode without saving choice

Pricing [2][1]

When this pricing option is set to Per Schedule, it allows merchandise to be sold at different prices at preset times.

DISPLAY: “**PRICING NORMAL**”

- [1] Toggles between NORMAL and Per Schedule
- [0] Saves choice and returns to the top of the service mode
- [RESET] Returns to the top of the service mode without saving choice

If you choose Per Schedule, go to the “Set Schedules” menu [7][0].

Discount [2][2]

When this option is set to Per Schedule, it allows merchandise to be sold at discount prices at pre-set times.

DISPLAY: “**DISCOUNT OFF**”

- [1] Toggles between OFF and Per Schedule
- [0] Saves choice and returns to the top of the service mode
- [RESET] Returns to the top of the service mode without saving choice

If you choose Per Schedule, go to the “Set Schedules” menu [7][0].

MultiView [2][3]

This option allows MultiView to be turned on, off, or to only run at scheduled times. If MultiView is set to on, it will rotate the turret three compartments for every three minutes of idle time.

DISPLAY: “**MULTIVIEW OFF**”

- [1] Toggles between OFF, ON, and Per Schedule.
- [0] Saves choice and returns to the top of the service mode.
- [RESET] Returns to the top of the service mode without saving choice

If you choose Per Schedule, go to the “Set Schedules” menu [7][0].

Sell by Shift [2][4]

This option activates the sell by shift option.

DISPLAY: “**SELL BY SHIFT OFF**”

- [1] Toggles between OFF and PER SCHEDULE
- [0] Save choice and returns to the top of the service mode
- [RESET] Returns to the top of the service mode without saving choice

If you choose PER SCHEDULE, go to the “Set Schedules” menu [7][0] on page 3-15.

OPTIONS CONTINUED

Shutdown [2][5]

This option allows you to leave the machine fully functional from a health control standpoint, but the lights stay off, turret rotation is inhibited, and all credit inputs are disabled. This action can be forced immediately or at scheduled times. If there is any credit on the machine when such a period is entered, it will be returned immediately.

DISPLAY: “**SHUTDOWN OFF**”

[1] Toggles between ON, OFF and PER Schedule

[0] Saves choice and returns to the top of the service mode

[RESET] Returns to the top of the service mode without saving choice

If you choose PER Schedule, go to the “Set Schedules” menu [7][0].

Sold Out Check [2][6]

When turned on, the 748 will prompt the operator to check all Delivery Doors for signs of tampering.

DISPLAY: “**SOLD OUT CHECK OFF**”

[1] Toggles between ON and OFF

[0] Saves choice and returns to the top of the service mode

[RESET] Returns to the top of the service mode without saving choice

NOTE: See section two for option description of Sold Out Check.

Force Vend [2][8]

Turns the Force Vend option on and off.

DISPLAY: “**FORCE VEND OFF**”

Key Function

[1] Toggles between ON and OFF

[0] Saves choice and returns to the top of the service mode

[RESET] Returns to the top of the service mode without saving choice

Free Vend Odds [2][9]

Set or change the odds that determine when a customer may win a free vend.

DISPLAY: “**FREE VND ODDS OFF**”

Key Function

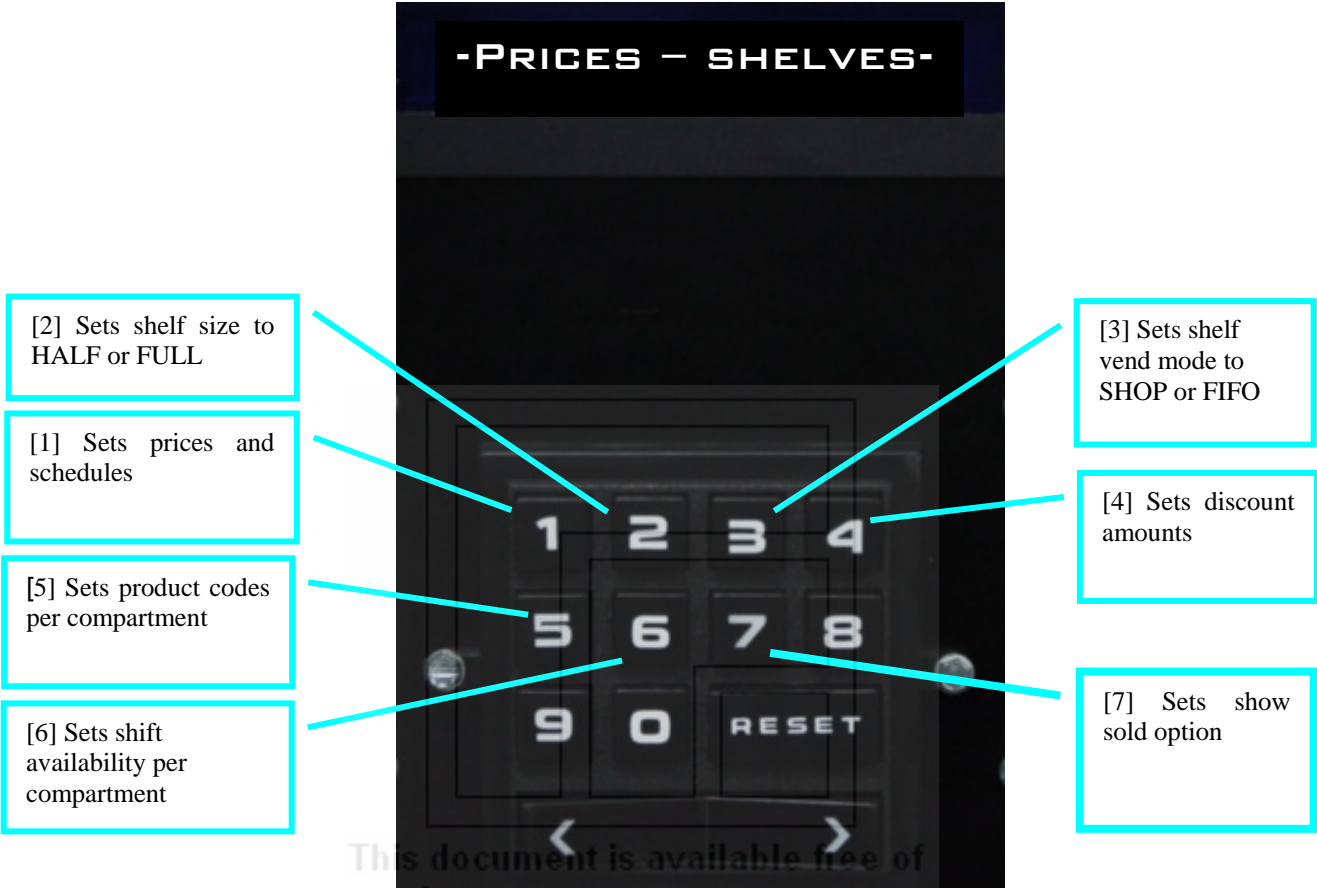
[1] Increments Odds from OFF to 3000 by 50

[2] Decrements Odds from 3000 to OFF by 50

[0] Saves choice and returns to the top of the service mode

[RESET] Returns to the top of the service mode without saving choice

Pressing the [3] Key from “Service” the display will prompt “Price – Shelves”



To Assign Price:
With correct price and schedule shown in display, SLIDE DELIVERY DOOR to right. Price Display adjacent to selection will immediately be updated to reflect new price

Pressing the [3] Key from “Service” the display will prompt “Price – Shelves”

KEY [3]

Prices - Shelves – This menu allows setting prices, price schedules, shelf size, product codes, discounts, and shift availability. Each function in this service menu requires a two-key entry to run; the first key is [3], and the second key is one of the following:

- [1] Sets prices and schedules
- [2] Sets shelf size to HALF or FULL
- [3] Sets shelf vend mode to SHOP or FIFO
- [4] Sets discount amounts
- [5] Sets product codes per compartment
- [6] Sets shift availability per compartment
- [7] Sets show sold option
- [8] Not used
- [9] Not used
- [0] Not used

Schedules/Prices [3][1]

Prices are set per shelf. Change the price shown on the Message Center until the desired price is shown. Then toggle the Delivery Door to assign the new price to the shelf. The Column Price Display will show the new price. Shelf prices for all three schedules are set with this function.

DISPLAY: “SCH x PRICE y.yy”

x is the schedule number [1..3]
y.yy is the price

Key Function

- [1] Increments price by coin scale
- [2] Decrements price by coin scale
- [3] Increments schedule number
- [4] Decrements schedule number
- [5] Increments shelf price by 10x the coin scale
- [6] Decrements shelf price by 10x the coin scale
- [RESET] Returns to the top of the service mode

NOTE: Use [7][0] to set the ON/OFF times for the schedules

Shelf Size [3][2]

This feature allows setting shelf sizes to either FULL or HALF. The Column Price Display will show the current shelf size assigned to each shelf, either FULL or HALF. Change shelf size on message center until desired shelf size is shown. Then toggle the Delivery Door to assign shelf size to desired shelf. The Price Display will update to show the new shelf size.

DISPLAY: “SHELF SIZE HALF”

- [1] Toggles between HALF and FULL
- [RESET] Returns to the top of the service mode

Shelf Mode [3][3]

This feature allows setting the shelf mode between normal (SHOP) vend mode and First-In- First-Out (FIFO) vend mode. The Column Price Display will show the current mode. Toggle the Delivery Door to assign the selected mode to a shelf. The Column Price Display will update to show the new mode.

DISPLAY: “SHELF MODE SHOP”

- [1] Toggles between SHOP and FIFO
- [RESET] Returns to the top of the service mode

Discount [3][4]

This feature allows setting price discounts. The discount range is between 0 and 2.00.

DISPLAY: “DISCOUNT x = .yy”

x is the discount number
yy is the discount amount

Key Function

- [1] Increments discount amount by coin scale
- [2] Decrements discount amount by coin scale
- [3] Increments discount number
- [4] Decrements discount number
- [5] Saves changes and increments to next discount
- [0] Saves changes and returns to the top of the service mode
- [RESET] Returns to the top of the service mode without saving choice

“Price – Shelves” Continued

Product Codes [3][5]

This feature allows setting product codes to each compartment. The Price Display will show the current product code assigned to the compartments. Change the product code on the Message Center until the desired product code is shown. At this time if product code is to be set to the entire shelf, press [7]. Toggle a Delivery Door to assign that product code to that specific compartment or shelf. The Column Price Display will update to show the new code. Rotate the turret to assign codes to all compartments.

NOTE: Press [7] before toggling door each time that product code is to be saved to the entire shelf.

DISPLAY: “**PRODUCT CODE 00**”

Key Function

- [1] Increments product code
- [2] Decrements product code
- [5] Increments product code by 10
- [6] Decrements product code by 10
- [7] Applies product code to entire shelf
- [RESET] Returns to the top of the service mode

Sell On Shift [3][6]

This feature allows setting of shifts when compartments are available to be sold. The Column Price Display will show the current shifts assigned to the compartments. Change the active shifts on the Message Center. At this time if current shifts is to be set to the entire shelf, press [7]. Toggle a Delivery Door to apply the new shift choice to a specific compartment or shelf. The Column Price Display will update to show the new shift assignment. Rotate the turret to assign shifts to all compartments.

NOTE: Press [7] before toggling door each time that a new shift choice is to be saved to the entire shelf.

DISPLAY: “**SELL ON SHIFT 1-2-3**”

- [1] Selects/Deselects shift 1
- [2] Selects/Deselects shift 2
- [3] Selects/Deselects shift 3
- [7] Applies shift selection to entire shelf
- [RESET] Returns to the top of the service mode

NOTE: When using this option, the on and off times for shifts 1,2,3 must be set with the Set Schedules Key [7][0].

Show Sold [3][7]

This feature allows setting the price column display to show “SOLD” when an item is sold or just display the item price.

DISPLAY: “**SHOW SOLD ON**”

Key Function

- [1] Toggles between ON and OFF
- [0] Saves choice and returns to the top of the service mode
- [RESET] Returns to the top of the service mode without saving choice

Pressing the [4] Key from “Service” the display will prompt “History”



Pressing the [4] Key from “Service” the display will prompt “History”

KEY [4]

History – This menu contains the Machine History Log, Error Log, and Temperature Logs. The operator may view, clear, or print logs from this menu. Each function in this service menu requires a two-key entry to run; the first key is [4], and the second key is one of the following:

- [1] View the History log
- [2] View the Error log
- [3] View the Temperature log
- [4] Not used
- [5] Clear the History log
- [6] Clear the Error log
- [7] Clear the Temperature log
- [8] Not used
- [9] Print a selected log
- [0] Not used

View History Log [4][1]

This feature allows the operator to view the last 50 events in the History Log.

DISPLAY: “**xx = logged event**”

xx is the event number
logged event is the event

- [1] Scrolls forward through History Log
- [2] Scrolls backward through History Log
- [3] Toggles between event and time/date of the event
- [RESET] Returns to the top of the service mode

History Log Detailed

When the log is displayed on the Message Center, the most recent event recorded will be displayed. If the log is full, the log entry number will be 49; otherwise, the log entry number will be the same as the number of entries in the log. As more entries are recorded, the oldest entries are discarded so only the most recent 50 remain in the log.

When the History Log is displayed, it requires two lines on the display. The first line shows the log number and the event, and the second line shows the time and date it was logged.

Example of history log entry displayed:

6 = POWER UP TIME

Push key [3] to display line 2:

6 = 8.05AM 1-05-01

Example history log printout: (see 4-9)

```
AUTOMATIC PRODUCTS
748 VER xx.xx
```

```
-----
HISTORY LOG
11:46 FRI 01-05-2001
-----
```

```
8:37AM 1-02-01 DEFAULTS LOADED
10:36AM 1-02-01 POWER DOWN TIME
10:41AM 1-02-01 POWER UP TIME
12:42PM 1-02-01 MAIN DOOR OPEN
12:45PM 1-02-01 MAIN DOOR CLOSE
4:23PM 1-04-01 POWER DOWN TIME
8:05AM 1-05-01 POWER UP TIME
```

Error Log [4][2]

This log contains a list of errors the machine has detected. This log includes the last 20 errors.

DISPLAY: “**xx = logged error**”

xx is the event number

- [1] Scrolls forward through Error Log
- [2] Scrolls backward through Error Log
- [3] Toggles between error and time/date the error occurred
- [RESET] Returns to the top of the service mode

Error Log Detailed

When the log is displayed on the Message Center, the most recent error recorded will be displayed. If the log is full, the log entry number will be 19, otherwise the log entry number will be the same as the number of entries in the log. As more entries are recorded, the oldest entries are discarded so only the most recent 20 remain in the log.

When the error log is displayed, it requires two lines on the display. The first line shows the log number and the error, and the second line shows the time and date it was logged.

Example of error log entry displayed:

1 = HEALTH TIME OUT

Push key [3] to display line 2:

1 = 10.36AM 1-02-01

Example error log printout: (see 4-9 to print)

```
AUTOMATIC PRODUCTS
748 VER xx.xx
```

```
-----
ERROR LOG
11:46 FRI 01-05-2001
-----
```

```
8:37AM 1-02-01 MAIN DOOR OPEN
10:36AM 1-02-01 HEALTH TIME OUT
```

History Continued

Temperature Log [4][3]

This log contains a minute-by-minute history of the temperature of the food compartment. It retains one hour's worth of data.

DISPLAY: "xx = yyF zzC C"

xx is the log entry number
yy is the logged temperature in Fahrenheit
zz is the logged temperature in Celsius
C indicates the compressor was on at this time

[1] Scrolls forward through the log
[2] Scrolls backward through the log
[RESET] Returns to the top of the service mode

Temperature Log Detailed

The Temperature Log is a log containing up to the last 60 minutes' worth of food compartment temperatures recorded in one-minute intervals.

When the log is displayed on the Message Center, the most recent temperature recorded will be displayed. If the log is full, the log entry number will be 59; otherwise, the log entry number will be the number of the last entry in the log. As more entries are recorded, the oldest entries are discarded so only the most recent 60 minutes' worth of temperatures remains in the log.

NOTE: The Temperature Log stops recording 20 minutes after error shutdown.

When the temperature is displayed, a 'C' at the end of the line indicates the compressor was running when the temperature was recorded.

Example of temperature log entry displayed:
59 = 36F 2C C

When the temperature log is printed, a graphic representation is also shown. The oldest temperature is at the top of the printout and the most recent temperature is at the bottom. A 'C' to the left of the temperature indicates the compressor was running at the time. An example of a temperature log printout:

(See 4-9 to print)

AUTOMATIC PRODUCTS	
748 VER xx.xx	

TEMPERATURE LOG	
11:46 FRI 01-05-2001	

C 39	*
C 38	*
C 37	*
C 36	*
C 35	*
C 34	*
34	*
35	*
37	*
38	*
39	*

Clear History Log [4][5]

This feature allows the operator to clear the History Log.

DISPLAY: "CLR HISTORY LOG NO"

[1] Toggles between NO and YES
[0] Clears the log if set to YES
(displays "-SAVING") and returns to the top of the service mode
[RESET] Returns to the top of the service mode without clearing the log

Clear Error Log [4][6]

This feature allows the operator to clear all data from the Error Log.

NOTE: Clearing the Error Log will not clear any error currently on the machine.

DISPLAY: "CLR ERROR LOG NO"

Key Function

[1] Toggles between NO and YES
[0] Clears the log if set to YES
(displays "-SAVING") and returns to the top of the service mode
[RESET] Returns to the top of the service mode without clearing the log

“History” Continued

Clear Temperature Log [4][7]

This feature allows the operator to clear all data from the Temperature Log.

DISPLAY: “CLR TEMP LOG NO”

[1] Toggles between NO and YES

[0] Clears the log if set to YES

(displays “-SAVING”) and returns to the top of the service mode

[RESET] Returns to the top of the service mode without clearing the log

Print Logs [4][9]

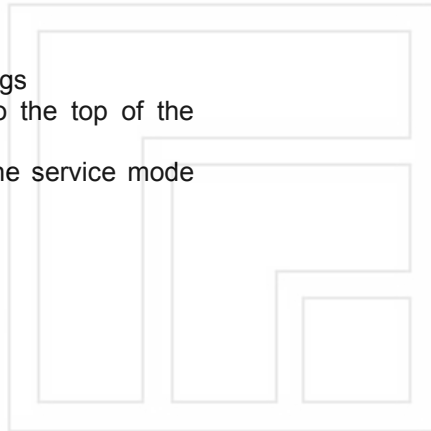
This feature allows the operator to print the Temperature Log, History log, Error Log, Schedules, or Pulldown log.

DISPLAY: “PRINT TEMP LOG”

[1] Scrolls through the available logs


[0] Prints the log then returns to the top of the service mode

[RESET] Returns to the top of the service mode without printing the log



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Pressing the [5] Key from “Service” the display will prompt “Cash Sys Type”



#1 key
Toggles Option

#5 key
Accepts and SAVES changes, and advances to next step

#6 key
Does not save change, and advances to next step

Reset key -
Escape and return to top of menu

IMPORTANT:
At the completion of changing or saving any of the Payment System options, the machine must be turned off, and then back on to permit the control board to properly initialize the changes.

Pressing the [5] Key from “Service” the display will prompt “Cash System Type”

KEY [5]

Cash System Type – This menu allows selection of the cash system used in the 748. The supported cash system types are: DUMB, MDB, and EXEC (Protocol A). Both the MDB and DUMB cash system types allow additional options to be set. Using key [5] or [6] will advance to the options available for the selected cash system type.

NOTE: Be sure to power the 748 OFF then back ON after SAVING a cash system type even if it was not changed.

DISPLAY: “CASH SYS TYPE -DUMB”

Note: If you choose Dumb go to page 3.20

- [1] Toggles available choices
- [5] Saves choice and proceeds to the next option for the selected cash system
- [6] Proceeds to the next option for the current cash system without saving
- [0] Saves choice and returns to the top of the service mode
- [RESET] Returns to the top of the service mode without saving

NOTE: When reviewing the cash system options, key [6] may be used to quickly view one option after another without having to SAVE each option.

MDB CASH SYSTEM OPTIONS

Coin Mech – If a coin changer is connected, set to YES, otherwise set to NO.

DISPLAY: “COIN MECH YES”

Key Function

- [1] Toggles between YES and NO
- [5] Saves choice and proceeds to the next option
- [6] Proceeds to the next option without saving
- [0] Saves choice and returns to the top of the service mode
- [RESET] Returns to the top of the service mode without saving

Tube Sensing – An MDB coin changer will automatically keep track of coins in the tubes. To use this feature, set Tube Sensing to AUTO. Due to the design of some coin changers, they cannot report the exact number of coins in the coin tubes. To ignore the coin tube counts

reported by the coin changer, set Tube Sensing to MAN (manual).

This will allow the 748 to keep track of coins deposited and dispensed from the coin changer.

NOTE: Some coin changers will not dispense a coin even when commanded to do so. In this case, the tube counts in the 748 will become corrupt and a customer may get short changed. Before using the manual tube sensing option, be sure the coin changer will operate its dispensing mechanism regardless of the number of coins in the tube, especially when the tube is almost empty.

DISPLAY: “TUBE SENSING MAN”

- [1] Toggles between MAN and AUTO
- [5] Saves choice and proceeds to the next option
- [6] Proceeds to the next option without saving
- [0] Saves choice and returns to the top of the service mode
- [RESET] Returns to the top of the service mode without saving

Accept Small Coins – Some MDB coin changers are set up to accept coin values smaller than the lowest value coin stored in a coin tube. Setting this option to NO will cause the coin changer to reject these smaller value coins. Set this option to YES if small coins should be accepted. Prices are set based on the lowest value coin stored in a coin tube. If small coins are accepted, it is possible to have leftover credit that cannot be returned to the customer.

DISPLAY: “ACPT SMALL COINS NO”

- [1] Toggles between YES and NO
- [5] Saves choice and proceeds to the next option
- [6] Proceeds to the next option without saving
- [0] Saves choice and returns to the top of the service mode
- [RESET] Returns to the top of the service mode without saving.

“Cash System Type MDB” Continued

Overbuy Enabled – This feature works with the small coins option. If small coins are accepted and a credit that cannot be returned is left on the machine, that credit will be cleared and credited to Overbuy in the audit data if the Overbuy option is set to YES. Set this option to NO to leave the leftover credit on the machine.

DISPLAY: “**OVERBUY ENABLED NO**”

[1] Toggles between YES and NO
[5] Saves choice and proceeds to the next option
[6] Proceeds to the next option without saving
[0] Saves choice and returns to the top of the service mode
[RESET] Returns to the top of the service mode without saving

Card Reader – If a Card Reader is connected, set to YES; otherwise, set to NO.

DISPLAY: “**CARD READER NO**”

[1] Toggles between YES and NO
[5] Saves choice and proceeds to the next option
[6] Proceeds to the next option without saving
[0] Saves choice and returns to the top of the Service Mode without saving
[RESET] Returns to the top of the service mode without saving

Card Message – Set this option to “CREDIT” to have all of the card’s credit shown on the display when the card is entered into the reader. Setting this option to “PRICE” will show on the display the value of max. price on the machine or the credit value from the card, depending on which is lower. Setting this option to “MESSAGE” will display “MAKE SELECTION” when the card is entered. This option will only appear when the Card Reader option is set to YES.

DISPLAY: “**CARD CREDIT**”

Key Function

[1] Toggles between CARD CREDIT, CARD PRICE, and CARD MESSAGE
[5] Saves choice and proceeds to the next option
[6] Proceeds to the next option without saving

[0] Saves choice and returns to the top of the service mode without saving
[RESET] Returns to the top of the service mode without saving

Bill Acceptor – If Bill Acceptor is connected, set to YES; otherwise, set to NO.

DISPLAY: “**BILL VALIDATOR YES**”

[1] Toggles between YES and NO
[5] Saves choice and proceeds to the next option
[6] Proceeds to the next option without saving
[0] Saves choice and returns to the top of the service mode
[RESET] Returns to the top of the service mode without saving

Accept Bills – This option will allow a choice of which bill denominations to accept and which to return. All denominations that can be accepted by the MDB bill validator will be presented for selection. If a bill denomination is to be accepted, set to YES, otherwise set to NO.

NOTE: If the display shows “NO BA COMM”, communication with the bill validator has not been established. Ensure all harnesses are plugged in properly and the cash system type is set to MDB. The power to the 748 may have to be cycled OFF then back ON to reset the cash system settings before communication will be established.

NOTE: Key [5] or [6] will advance to the next bill denomination that the bill validator can accept. When the last bill is displayed, the display will go back to the top of the option list and show the coin changer option.

DISPLAY: “**ACCEPT xx.00 YES**”

xx is the denomination to accept or not

Key Function

[1] Toggles between YES and NO
[5] Saves choice and proceeds to the next option
[6] Proceeds to the next option without saving
[0] Saves choice and returns to the top of the service mode
[RESET] Returns to the top of the service mode without saving

“Cash System Type MDB” Continued

Token Options – This option appears if token acceptance was turned on in the Accept Bills menu. (Note: the Bill Acceptor must accept tokens for this feature to be accessed.)

The Token Vend feature has 3 different options for handling Token acceptance:

1.) **Token Cash Value** - If this option is chosen, the token will be treated as a bill with the cash value set on the right side of the display.

DISPLAY: “**TOKEN CASH VAL .00**”

[1] Toggles between TOKEN CASH VAL, TOKEN PC R, and TOKEN FREE ANY

[3] Increments Cash value

[4] Decrements Cash value

[5] Saves choice and proceeds to the next option

[6] Proceeds to the next option without saving

[0] Saves choice and returns to the top of the service mode

[RESET] Returns to the top of the service mode without saving

2.) **Token Product Code Range** - If this option is chosen, it will allow a free vend of any product within a product code range when a token is accepted.

DISPLAY: “**TOKEN PC R 00 to 00**”

[1] Toggles between TOKEN CASH VAL, TOKEN PC R, and TOKEN FREE ANY

[3] Increments 1st product code range

[4] Decrements 1st product code range

[5] Saves choice and proceeds to the next option

[6] Proceeds to the next option without saving

[7] Increments 2nd product code range

[8] Decrements 2nd product code range

[0] Saves choice and returns to the top of the service mode

[RESET] Returns to the top of the service mode without saving

3.) **Token Free Any** - If this option is chosen, the machine will allow a free vend of any product in the machine.

DISPLAY: “**TOKEN FREE ANY**”

[1] Toggles between TOKEN CASH VAL, TOKEN PC R, and TOKEN FREE ANY

[5] Saves choice and proceeds to the next option

[6] Proceeds to the next option without saving

[0] Saves choice and returns to the top of the service mode

[RESET] Returns to the top of the service mode without saving

Token Vend Only – This feature only appears with Token Vend Product Code. If set to YES, then items within the set product code range may only be purchased with a token. If set to NO, then those items may be purchased with cash or tokens.

DISPLAY: “**TOKEN ONLY NO**”

[1] Toggles between YES and NO

[5] Saves choice and proceeds to the next option

[6] Proceeds to the next option without saving

[0] Saves choice and returns to the top of the service mode

[RESET] Returns to the top of the service mode without saving

“Cash System Type DUMB MECH”

DUMB MECH CASH SYSTEM OPTIONS

Coin Mech – If the coin mech is connected, set to YES; otherwise, set to NO.

DISPLAY: “**COIN MECH YES**”

Key Function

- [1] Toggles between YES and NO
- [5] Saves choice and proceeds to the next option
- [6] Proceeds to the next option without saving
- [0] Saves choice and returns to the top of the service mode
- [RESET] Returns to the top of the service mode without saving

Tube Sensing – The Tube Sensing option determines how the 748 will keep track of coin changer tube coin counts. Coin tube counts are changed as coins are deposited and dispensed from the coin changer.

Setting this option to COUNT will cause the 748 to ignore the coin tube level sensors in the coin changer.

Setting this option to LEVEL will cause the tube counts to be adjusted based on the coin tube level sensors. If a coin tube count is greater than 4 and that tube sensor uncovers, the count will be adjusted to 4. Similarly, if a coin tube count is less than 4 and that tube sensor is covered, the count is set to 4.

NOTE: Some coin changers will not dispense a coin even when commanded to do so. In this case, the tube counts in the 748 will become corrupt and a customer may get short changed. Before using the COUNT Tube Sensing option, be sure the coin changer will operate its dispensing mechanism regardless of the number of coins in the tube, especially when the tube is almost empty.

DISPLAY: “**TUBE SENSING LEVEL**”

- [1] Toggles between LEVEL and COUNT
 - [5] Saves choice and proceeds to the next option
 - [6] Proceeds to the next option without saving
 - [0] Saves choice and returns to the top of the service mode
 - [RESET] Returns to the top of the service mode without saving
-

Card Reader – If card reader is connected, set to YES; otherwise, set to NO.

DISPLAY: “**CARD READER NO**”

- [1] Toggles between YES and NO
 - [5] Saves choice and proceeds to the next option
 - [6] Proceeds to the next option without saving
 - [0] Saves choice and returns to the top of the service mode
 - [RESET] Returns to the top of the service mode without saving
-

Bill Validator – If Bill Validator is connected, set to YES; otherwise, set to NO.

DISPLAY: “**BILL VALIDATOR YES**”

- [1] Toggles between YES and NO
- [5] Save choices and proceeds to the next option
- [6] Proceeds to the next option without saving
- [0] Saves choice and returns to the top of the service mode
- [RESET] Returns to the top of the service mode without saving

Decimal Point Position – This option is only valid when a coin changer is not configured. The coin changer determines the price multiple and decimal point position. When a coin changer is not configured, this option will allow setting of the decimal point position.

DISPLAY: “**DECIMAL PT POS .00**”

- [1] Scrolls the decimal point forward through the available positions
- [2] Scrolls the decimal point backwards through the available positions
- [5] Saves choice and proceeds to the next option
- [6] Proceeds to the next option without saving
- [0] Saves choice and returns to the top of the service mode
- [RESET] Returns to the top of the service mode without saving

“Cash System Type DUMB MECH” Continued

Price Multiple – This option is only valid when a coin changer is not configured. The coin changer determines the price multiple and decimal point position. When a coin changer is not configured, this option will allow setting of the price multiple.

DISPLAY: “**PRICE MULTIPLE .05**”

[1] Scrolls forward through the available price multiple settings
[2] Scrolls backwards through the available price multiple settings
[5] Saves choice and proceeds to the next option
[6] Proceeds to the next option without saving
[0] Saves choice and returns to the top of the service mode
[RESET] Returns to the top of the service mode without saving

Bill Validator Type – This options allows selection of the type of bill validator interface used. A serial bill validator must use the Rowe RBA-7 Serial Interface, the Mars VFM4 serial interface, or equivalent. A pulse bill validator must output pulses on a single line with approximately 50-millisecond on and off pulses.

DISPLAY: “**BILL VAL TYPE PULSE**”

[1] Toggles between PULSE and SERIAL
[5] Saves choice and proceeds to the next option
[6] Proceeds to the next option without saving
[0] Saves choice and returns to the top of the service mode
[RESET] Returns to the top of the service mode without saving

Escrow Capable – a serial bill validator is escrow capable. Set this option to YES for a serial bill validator. If the pulse interface bill validator conforms to the CBA2 escrow protocol, set this option to YES.

DISPLAY: “**ESCROW CAPABLE YES**”

[1] Toggles between YES and NO
[5] Saves choice and proceeds to the next option
[6] Proceeds to the next option without saving
[0] Saves choice and returns to the top of the service mode
[RESET] Returns to the top of the service mode without saving

Accept Bills – This option will allow a choice of which bill denominations to accept. If a bill denomination is to be accepted, set to YES; otherwise, set to NO

NOTE: Key [5] or [6] will advance to the next bill denomination.

DISPLAY: “**ACCEPT xx.00 YES**”

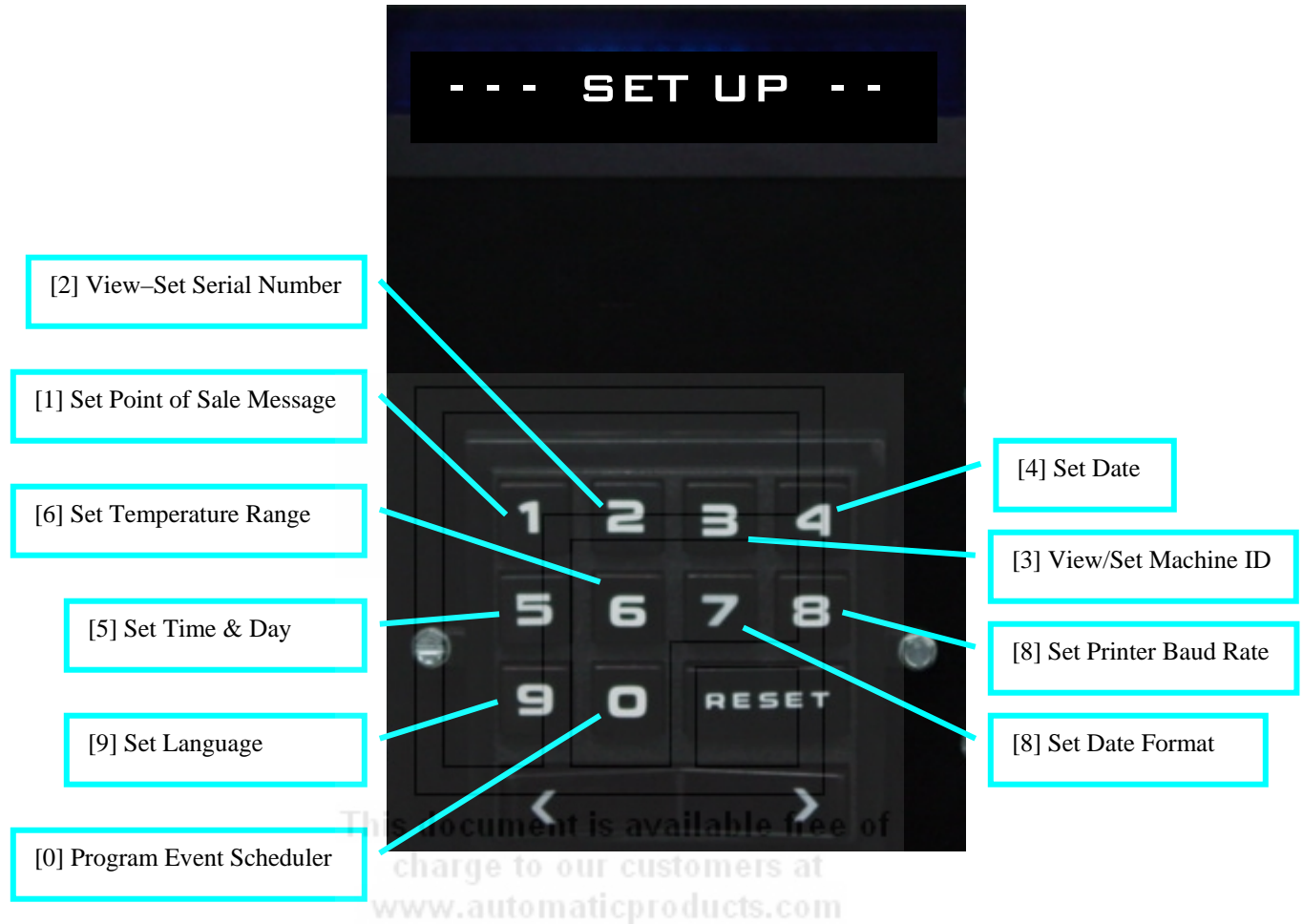
xx is the denomination to accept or not

[1] Toggles between YES and NO
[5] Saves choice and proceeds to the next option
[6] Proceeds to the next option without saving
[0] Saves choice and returns to the top of the service mode
[RESET] Returns to the top of the service mode without saving

EXEC MECH CASH SYSTEM OPTIONS

No Programmable options available.

Pressing the [7] Key from “Service” the display will prompt “SET UP”



Pressing the [7] Key from “Service” the display will prompt “SET UP”

KEY [7]

Set Up – This menu allows the operator to set various machine parameters. Each function in this service menu requires a two-key entry to run; the first key is [7], and the second key is one of the following:

- [1] Set point of sale message
- [2] View/set serial number
- [3] View/set machine ID number
- [4] Set the date
- [5] Set the time and day
- [6] Set the food compartment temperature range
- [7] Set the date format
- [8] Set the printer baud rate
- [9] Set the language
- [0] Program the event scheduler

Point-of-Sale Message [7][1]

This menu allows changing the point-of-sale message. A point-of-sale message may be up to 250 characters long; however, the display can only show a small portion of the message at one time. Therefore, when this function is started, only the first 14 to 17 characters of the message will be displayed.

The first character in the message will be blinking. This is the insertion point, and the blinking character is the **focus** character. The character on the far right of the display is the current character. The keys specified below are used to change the current character and to insert it into the message at the insertion point. The current character (on the right) can overwrite the focus character (flashing) or can be inserted after the focus character.

The [1] & [2] keys are used to move the message left and right while the insertion point stays in the same place on the display. This moves the focus character position along the message for editing. When a message is moved all the way to the left, '[' characters will be shifted in on the right. These characters represent the end of the message.

DISPLAY: “**P] INSERT MONEY - A**”

- [1] Moves the message left 1 position
- [2] Moves the message right 1 position
- [3] Increments the current character
- [4] Decrements the current character
- [5] Overwrites the focus character with the current character

[6] Inserts the current character at the insert position

[7] Deletes the focus character

[9][0] Deletes the message from the focus character to the end

[0] Saves choice and returns to the top of the service mode

[RESET] Returns to the top of the service mode without saving

Serial Number [7][2]

Change the machine serial number stored in the 748 Machine Controller.

DISPLAY: “SERIAL # 00000000”

[x] Press any number key and that number will be shifted into the serial number from the right. The new serial number will automatically be stored when the 8th number key is pressed

[RESET] Returns to the top of the service mode without saving

Machine ID [7][3]

Change the machine ID number stored in the 748 Machine Controller.

DISPLAY: “**MACH ID 00000000**”

[x] Press any number key and that number will be shifted into the serial number from the right. The new machine ID number will automatically be stored when the 8th number key is pressed

[RESET] Returns to the top of the service mode without saving

Set Date [7][4]

View and change the current date.

DISPLAY: “SET DATE mm-dd-yyyy” or
“SET DATE dd-mm-yyyy”

mm is the month

dd is the day

yyyy is the year

Key Function

[1] Increments the month

[2] Decrements the month

[3] Increments the date

[4] Decrements the date

[7] Increments the year

[8] Decrements the year

[0] Saves choice and returns to the top of the service mode

[RESET] Returns to the top of the service mode without saving

“SET UP” Continued

Set Time [7][5]

View and change the current time.

NOTE: After changing the time, cycle the power to re-sync the event schedules.

DISPLAY: “**SET TIME hh.mm ddd**”

hh is the hour

mm is the minute

ddd is the day of the week

[1] Increments the hour

[2] Decrements the hour

[3] Increments the minute

[4] Decrements the minute

[7] Increments the day

[8] Decrements the day

[0] Saves choice and returns to the top of the service mode

[RESET] Returns to the top of the service mode without saving

Temp Range [7][6]

Change the temperature range for the food compartment. The range choices are:

34°F - 41°F*

1°C - 3°C

3°C - 5°C

5°C - 8°C

DISPLAY: “**TEMP RANGE 34F - 41F**”

Key Function

[1] Toggles between the available temperature ranges

[0] Saves choice and returns to the top of the service mode

[RESET] Returns to the top of the service mode without saving

*U.S. FDA requirements are met by using any range except 5°C - 8°C. For best performance in U.S. machines, choose the 34°F - 41°F range.

Date Form [7][7]

Change the Date format.

DISPLAY: “**DATE FORM mm-dd-yyyy**”

Key Function

[1] Toggles between mm-dd-yyyy and dd-mm-yyyy

[0] Saves choice and returns to the top of the service mode

[RESET] Returns to the top of the service mode

without saving

Baud Rate [7][8]

Change the baud rate used to communicate with serial printers.

DISPLAY: “**BAUD RATE 9600**”

[1] Scrolls through the available choices

[0] Saves choice and returns to the top of the service mode

[RESET] Returns to the top of the service mode without saving

Language [7][9]

Choose the language used on the machine display in the operating mode. Service mode messages will remain in English.

DISPLAY: “**LANGUAGE ENGLISH**”

[1] Scrolls through the available choices

[0] Saves choice and returns to the top of the service mode

[RESET] Returns to the top of the service mode without saving

SET UP” Continued

Set Schedules [7][0]

This option allows the operator to set the ON and OFF times for those events that run on schedules, such as MultiView, Discounts, Prices and Shifts. Events are selected using three different lines. The first line defines the event number and the event type. The second line sets the ON time of the event. The third line sets the OFF time of the event. All three lines must be properly set up or the programmed event may not work as desired. Schedules may be printed by using the Print Logs function in the History menu under **KEY [4]** of the Service Mode.

DISPLAY: “EVT xx NO EVENT“

xx is the event number [0..24]

- [1] Cycles forward through the events
- [2] Cycles backward through the events
- [5] Increments the event number
- [6] Decrements the event number
- [7] Advances to display ON time
- [9] Resets the event to NO EVENT
- [RESET] Returns to the top of the service mode

DISPLAY: “EVT xx ON hh.mm ddd“

xx is the event number
hh is the hour
mm is the minute
ddd is the day of the week

Key Function

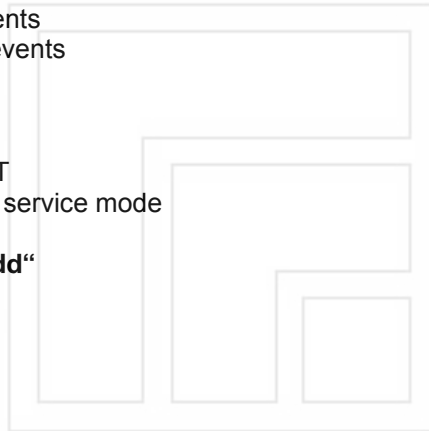
- [1] Increments the hour
- [2] Decrements the hour
- [3] Increments the minute
- [4] Decrements the minute
- [5] Increments the event number
- [6] Decrements the event number
- [7] Advances to display OFF time
- [8] Increments the day
- [9] Resets the event to NO EVENT
- [RESET] Returns to the top of the service mode

DISPLAY: “EVT xx OFF hh.mm ddd“

xx is the event number
hh is the hour
mm is the minute
ddd is the day of the week

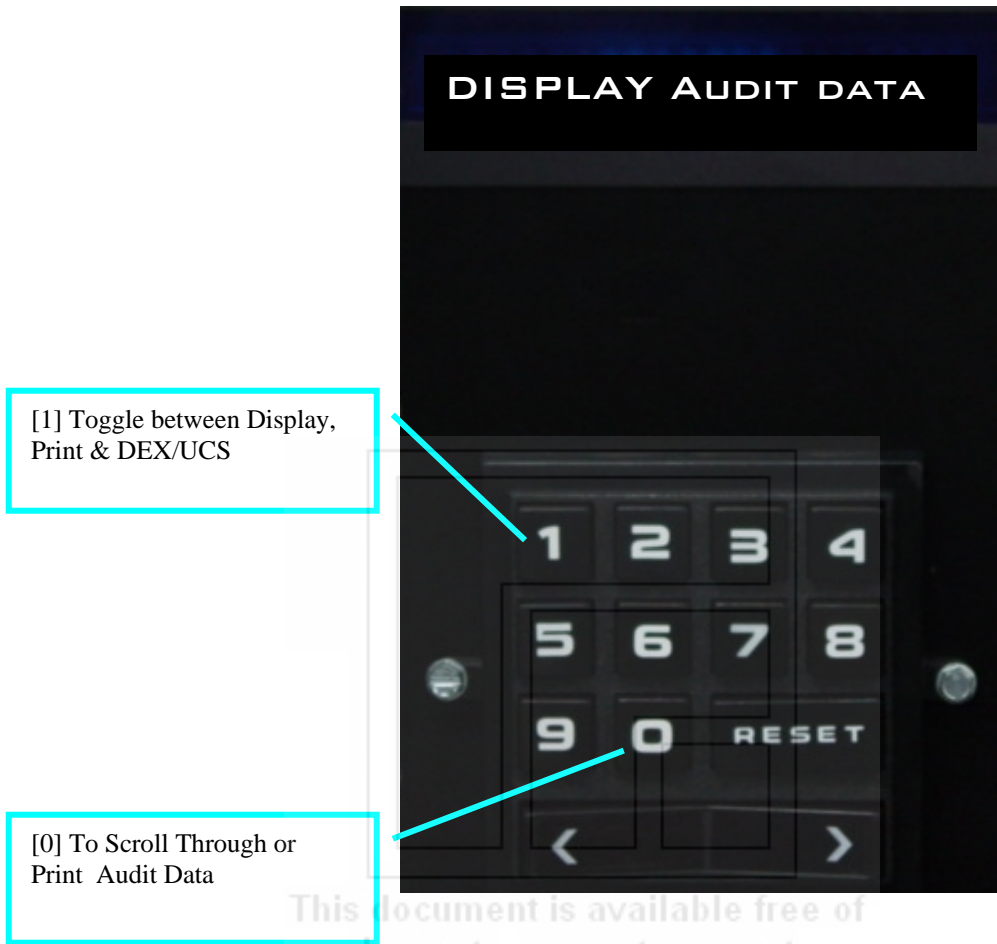
Key Function

- [1] Increments the hour
- [2] Decrements the hour
- [3] Increments the minute
- [4] Decrements the minute
- [5] Increments the event number
- [6] Decrements the event number
- [7] Advances to display the event
- [8] Increments the day
- [9] Resets the event to NO EVENT
- [RESET] Returns to the top of the service mode



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Pressing the [8] Key from “Service” the display will prompt “Display Audit Data”



KEY [8]

Audit Data – This menu item allows the operator to view, print, or download the audit data stored in the 748.

DISPLAY: “**DISPLAY AUDIT DATA**”

[1] Toggles between DISPLAY, PRINT, and DEX/UCS

[0] • If DISPLAY is showing - audit data will be displayed on the Message Center. Continue to press [0] to scroll through the audit data.

• If PRINT is showing - the audit data will be sent to the serial printer

• If DEX/UCS is showing - the audit data will be sent to a hand held device through the serial connector in DEX/UCS format

[1] Toggles YES/NO

[0] To clear data

[RESET] Returns to the top of the service mode

At the end of the Audit Data, the user will be prompted “CLEAR AUDIT DATA N”. Use the [1] key to toggle between YES and NO. The [0] key will save the selection

Pressing the [9] Key from “Service” the display will prompt “Enter New Code”



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SECURITY

KEY [9]

Security – To protect specific menus from unauthorized access, the security feature may be enabled. Menus that are protected by security will not be allowed access until the proper four-digit code has been entered. Other menus will continue to be fully accessible.

If security is turned on and the security code has not been entered, the security feature allows the code to be entered in order to access the secured menus.

DISPLAY: **“ENTER NEW CODE”**

[x] Any numeric key pressed will show on the display as an “*”. When four digits have been entered, the machine will return to the top of the service mode

[RESET] Returns to the top of the service mode

NOTE: If the security code is not entered properly, the secured menus will not be accessible. If this happens, reenter the security code.

If security is turned off or the security code has already been entered, the security feature will operate as follows:

DISPLAY: **“ENTER NEW CODE”**

Key Function

[x] Any numeric key pressed will show as an “*” on the display. When four digits have been entered, the “*”s will blink 3 times and the security function will advance to the menu security programming mode

[RESET] Returns to the top of the service mode

Menu security programming mode – this mode allows the overall security feature to be turned ON and OFF.

DISPLAY: **“SECURITY OFF”**

Key Function

[1] Toggles between ON and OFF

[5] Saves choice and proceeds to specific menu security setting

[6] Advances to specific menu security setting without saving

[0] Saves and returns to the top of the service mode

[RESET] Returns to the top of the service mode without saving

Specific menu security – this mode allows each menu to be individually secured.

DISPLAY: **“MENU x SECURITY OFF”**

x is the menu number

[1] Toggles between ON and OFF

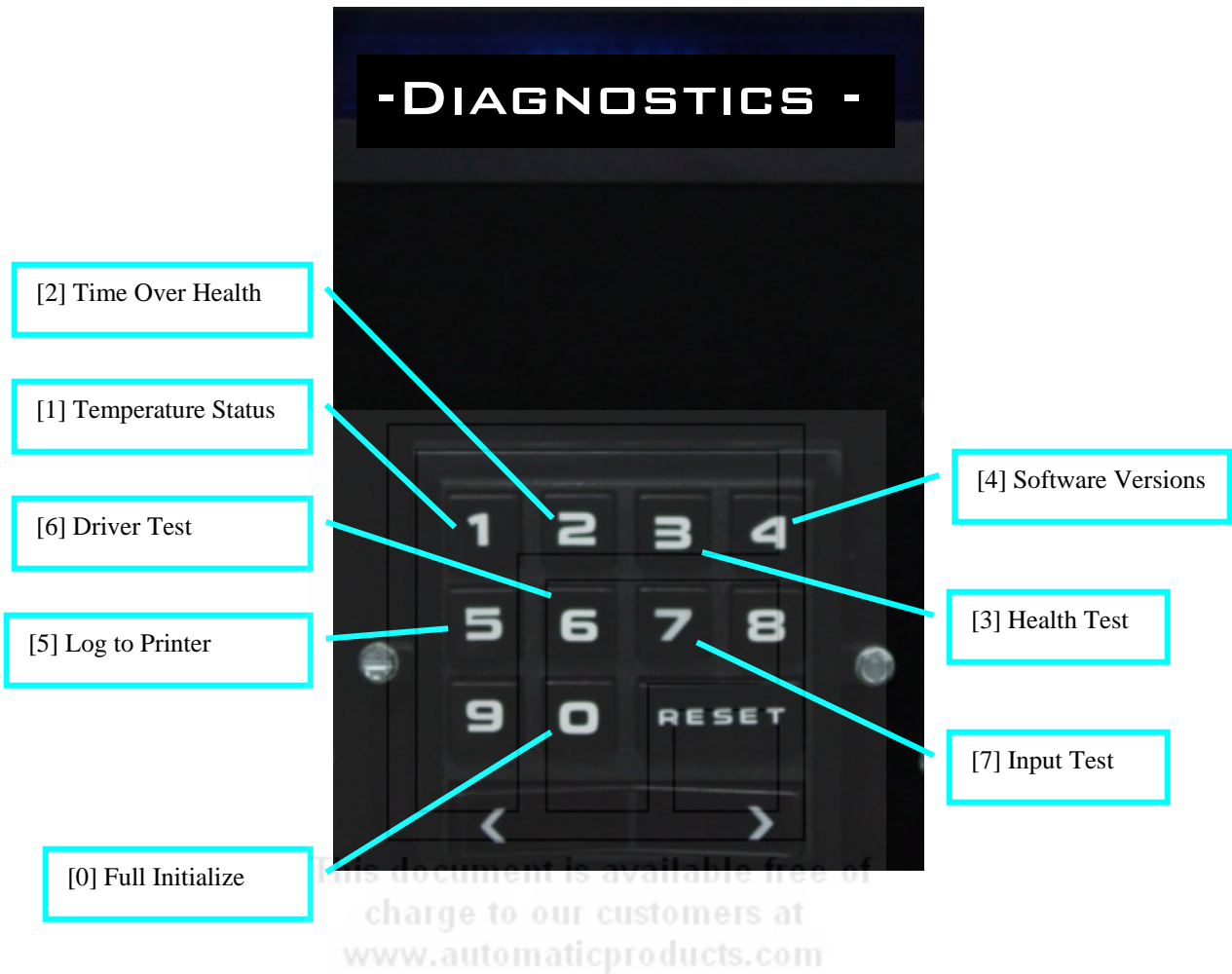
[5] Saves choice and proceeds to specific menu security setting

[6] Advances to specific menu security setting without saving

[0] Saves and returns to the top of the service mode

[RESET] Returns to the top of the service mode

Pressing the [0] Key from “Service” the display will prompt “Diagnostics”



“Diagnostics”

KEY [0] Diagnostics – There are several diagnostic functions built into the 748 to aid in troubleshooting. Each diagnostic item discussed below is accessed using the keypad in the service mode. Each function in this service menu requires a two-key entry to run; the first key is [0], and the second key is one of the following:

- [1] Temperature status
- [2] Time over health
- [3] Health test
- [4] Software versions
- [5] Log to printer
- [6] Driver test
- [7] Input test
- [8] Not used
- [9] Not used
- [0] Full initialize

Temperature Status [0][1]

This feature displays the food compartment real time temperature in Fahrenheit and Celsius. When the compressor is running, the letter C will appear on the far right of the display. A blinking asterisk demonstrates the update rate of the display. See *Temperature Status* under *Diagnostics* in *Section 4* for more information.

DISPLAY: “TEMP = 39F 3C * C”

[RESET] Returns to the top of the service mode

Time Over Health [0][2]

Time Over Health is useful in determining how long the food compartment was over the health temperature and how warm the food compartment actually got during that time. The maximum temperature will be displayed in °F or °C depending on the temperature range setting of the 748.

With this data, a more informed decision may be made as to what products to discard after a health control shut down error.

This feature shows hours, minutes, and seconds that the food compartment has been above the maximum allowed temperature. Also, it will display the highest temperature the food compartment reached during this time.

DISPLAY: “hh.mm.ss 73F MAX”

Key Function

[RESET] Returns to the top of the service mode

Health Test [0][3]

This diagnostic will test the health control system without having to wait the full time out time.

DISPLAY: “HEALTH TEST OFF”

Key Function

[1] Toggles between ON and OFF

[0] Saves and returns to the top of the service mode

[RESET] Returns to the top of the service mode

Complete Health Test Instructions

The Health Test diagnostic is used to check the health control system without waiting the full time over health time for the error to occur. To perform the Health Test:

1) Open the coin changer compartment door and the large main door.

2) Proceed to the service menu.

3) From “--- SERVICE MENU ---”,

Press [0][1].

Display “--- DIAGNOSTICS ---”, (then)

Display “TEMP = xxF yyC * C”

4) Open the Main Door. With the Message Center locked into the Coin Door, position the Coin Door so that the Message Center may be viewed by looking through the Delivery Door.

5) Pull the Main Door Switch out.

6) Remove the evaporator screen and locate the temperature sensor on the evaporator deflector.

7) Place your fingers on the temperature sensor to raise the temperature above 75°F. Use the Message Center to monitor the temperature.

8) When the temperature rises above 80°F,

Press the following keys:

[RESET][0][3][1][0]

Display will be:

“--- SERVICE MENU ---”

“--- DIAGNOSTICS ---”

“HEALTH TEST OFF”

“HEALTH TEST ON”

“SAVING”

“SERVICE MENU”

9) Close the Coin Compartment Door. Leave the Main Door opened. The Main Door Switch being pulled out prevents a Main Door error.

10) Press hot key 2; the display should show “HEALTH CONTROL ON”.

11) Use hot key 1 to monitor the temperature. The temperature must not fall below 41°F. If it does the test is invalid and must be run again.

12) The 748 should go out of service within 20 seconds.

HEALTH TEST [0,3] continued

- 13) Open the Coin Compartment Door and verify the error message is "HEALTH TIMEOUT". At this time, save "CLEAR ERRORS YES".
- 14) Replace the evaporator screen.
- 15) Close the Main Door.
- 16) Close the Coin Compartment Door.
- 17) Test and verify the machine returns to the operating mode.

Software Version Numbers [0][4]

This diagnostic will display the version numbers of the software on the control boards.

DISPLAY: "**CONTROL MODULE xx.xx**"

- [1] Scrolls through the software versions
- [RESET] Returns to the top of the service mode

The display will show the following for each module:

CONTROL MODULE xx.xx

CREDIT MODULE xx.xx

DISPLAY MODULE xx.xx

PRICE MODULE xx.xx

TURRET MODULE xx.xx

TALKER MODULE xx.xx

If a module is not responding, the version number displayed will be "-.-.-".

If the Talker Module is not installed, the version number will displayed will be "00.00".

Log to Printer [0][5]

This feature enables or disables the logging of temperatures to the printer. See *Log To Printer* under *Diagnostics* in *Section 4* for more information.

DISPLAY: "**LOG TO PRINTER OFF**"

- [1] Toggles between OFF and ON
- [0] Saves choice and returns to the top of the service mode
- [RESET] Returns to the top of the service mode

The Log To Printer diagnostic is used to print food compartment temperatures and compressor status on a printer. This is useful for watching the refrigeration system. The 748 Machine Controller will send one line to the printer every minute until the Log To Printer diagnostic is turned off. Each line consists of a compressor status indicator followed by the food compartment temperature followed by a graphic representation of temperature. If the compressor status indicator shows 'C', the compressor is running, otherwise it is not running.

Example:

```
C 41 *
C 40 *
C 40 *
C 39 *
C 38 *
C 37 *
C 36 *
C 35 *
C 34 *
34 *
35 *
37 *
38 *
39 *
```

Driver Test [0][6]

The driver test diagnostic is used to help troubleshoot the delivery door drivers, the lock assemblies, and the turret interlock circuit. See test details on next page.

DISPLAY: "**DRIVER TEST SEQUENCE**"

- [1] Toggles between SEQUENCE and MANUAL
- [0] Starts the driver test
- [RESET] Returns to the top of the service mode

DISPLAY: "DRIVER TEST xx"

xx is the current driver being exercised

Driver test - sequence mode

- [0] Turns off the current driver and turns on the next driver
- [RESET] Returns to the top of the service mode

Driver test - manual mode

- [1] Scrolls forward through door selections
- [2] Scrolls backwards through door selections
- [0] Toggles the specific driver ON and OFF
- [RESET] Returns to the top of the service mode

Diagnostics Continued

Driver test detailed

The Driver Test diagnostic is used to help troubleshoot the delivery door drivers, lock assemblies, and the turret interlock circuit. There are two modes that can be used for the driver test: sequence and manual. When the Driver Test diagnostic is first started, the display will show "DIVER TEST SEQUENCE". Pushing the [1] key will toggle between SEQUENCE and MANUAL on the display. Push [0] to select the driver test that is displayed. The display will change and show "DRIVER TEST 01".

The Sequence Driver Test will energize each door latch driver in sequence starting with the 01 driver. Pushing the [0] key will advance the driver test to the next driver, shutting off the previous driver. The display will be updated to show the currently active driver. The driver numbers shown correlate to the delivery door number used to make FIFO selections. Pushing [0] when the last driver, 23, is active, will start the driver sequence over with driver 01. Push [RESET] to exit the Driver Test.

NOTE: Maximum solenoid on time is 5 sec. If a solenoid is not turned off by then, it will turn off automatically.

The Manual Driver Test will turn on and off the same driver each time the [0] key is pushed. When the display shows "DRIVER TEST 01", pushing [0] will turn the driver on. Pushing [0] again will turn the driver off. Pushing the [1] or [2] keys will change the driver to be tested and the display will change to show the new driver. Again, push [0] to turn the driver on and off.

NOTE: Maximum solenoid on time is 5 sec. If a solenoid is not turned off by then, it will turn off automatically.

While using the manual driver test, the turret interlock may be checked. When all drivers are off and all Delivery Doors are closed, the turret interlock relay on the relay interface board should be energized (LED lit). As each driver is turned on, the turret interlock relay should drop out (LED off). If the turret interlock relay stays energized with a driver turned on, check the switch in the associated door latch housing for proper operation.

Inputs Test [0][7]

The inputs diagnostic is used to help troubleshoot switch, sensor, and wire harness trouble. See input test details below.

DISPLAY: "INPUTS xx yy zz"

Key Function

[RESET] Returns to the top of the service mode

The Inputs diagnostic is used to help troubleshoot switch and wire harness trouble. When the Inputs diagnostic is running, the display will show "INPUTS xx yy zz", where xx, yy, and zz represent inputs on specific pins to the 748 Machine controller. The display is updated in real time so switches can be manipulated and the results will be shown on the display. The input data is mapped using binary bits displayed in hexadecimal format. Input mapping is defined as follows:

748 Machine Controller Inputs

xx	hex	input circuit	connector pin
bit 0	01	delivery door 04 switch	P9-7
bit 1	02	delivery door 11 switch	P9-8
bit 2	04	delivery door 12 switch	P9-9
bit 3	08	delivery door 13 switch	P9-10
bit 4	10	delivery door 14 switch	P9-11
bit 5	20	delivery door 21 switch	P9-12
bit 6	40	delivery door 22 switch	P9-13
bit 7	80	delivery door 23 switch	P9-14

yy	hex	input circuit	connector pin
bit 0	01	service switch	P8-1 and P1-12
bit 1	02	zero position switch	P8-2 and P1-13
bit 2	04	coin comp door switch	P8-3
bit 3	08	main door switch	P8-4
bit 4	10	not used	P8-6
bit 5	20	delivery door 01 switch	P9-2
bit 6	40	delivery door 02 switch	P9-3
bit 7	80	delivery door 03 switch	P9-4

zz	hex	input circuit	connector pin
bit 0	01	not used	
bit 1	02	not used	
bit 2	04	door open/unlocked	P6-1
bit 3	08	not used	
bit 4	10	RS-232 Rx/D signal	J1-2
bit 5	20	not used	
bit 6	40	RS-232 busy signal	J1-8
bit 7	80	not used	

Diagnostics Continued

Full Initialize [0][0]

This feature resets all machine options to the factory defaults.

DISPLAY: "FULL INITIALIZE NO"

Key Function

[1] Toggles between NO and YES

[0] If set to YES, will start the full initialization procedure

[RESET] Returns to the top of the service mode

Full Initialization Detailed

The Full Initialize diagnostic is used to reset all options, pricing, and resettable audit information to the factory default values. When replacing a 748 Machine Controller, this is a good way to ensure the machine is set up from a known condition. All options are turned off, all prices are set to 99.95, the cash system is set to DUMB, and the temperature range for the food compartment is set to 34°F - 41°F.

Being an electronic device, it is possible that the 748 Machine Controller may experience a corrupt memory location which can effect the way the 748 operates. After all efforts to correct a problem have failed, sometimes a full initialize will correct the problem. This is especially true if the problem develops after changing the EPROM or RAM chip on the 748 Main control board.

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Section 4: Troubleshooting

INTRODUCTION

This section contains technical information to assist in troubleshooting problems that may occur in the 748. Separate sections cover indicator lights, power up sequence, out of service messages, and specific module troubleshooting along with a discussion on the serial interface used to tie major system components together. While working to isolate a specific problem, please refer to the system block diagram and/or the system schematic for additional information.

OVERVIEW

The 748 control system consists of one primary control board and four secondary control boards. All four secondary control boards are connected to the primary control board via serial buss.

Primary Controller

748 Primary Control Board –

- Stores the machine setup options, sales data, and prices.
- Directly controls the delivery doors.
- Receives door open and latch interlock signals.
- Monitors all health processing.
- Using a serial interface the main controller also establishes and maintains communications with all Secondary Controllers.

Secondary Controllers

Credit Module –

- Establishes and maintains communication with any attached credit devices, i.e. coin mech, bill validator, debit card reader.
- Presents a common interface to the machine controller for credit devices.

Message Center –

- Displays messages to the customer on a 20-character vacuum fluorescent display.
- Sends customer/operator key presses to the machine controller.

Column Price Displays –

- Displays shelf prices and other compartment parameters.

Refrigeration/Turret Module –

- Performs refrigeration system control.
- Reads and transfers probe temperatures to the machine controller.
- Performs turret motor movement and half cycle switch monitoring.

The Power Supply –

Consists of a single dual-secondary transformer supplying 18 and 24 Volts AC to the relay interface board.

The Relay Interface Board –

The 24 Volts AC is routed to the Credit Module for bill validator power, also rectified and routed to the Credit Module as +24 Volts pulsed DC to power the Credit Module and provides coin return solenoid power to a coin mech. The 18 Volt AC secondary is rectified and filtered to provide +24 Volts DC which is routed to the 748 Machine controller and the Refrigeration/Turret Module. The 748 Machine Controller, Credit Module, and Refrigeration/Turret Module each have their own low voltage power supply circuits on board.

Serial Communications

The SerialLink is a proprietary communication interface used in the 748 to tie major component modules together. The 748 Controller sends Serial messages to each of the four Serial devices and then listens for responses. Serial devices include the Credit Module, the Refrigeration/Turret Module, the Column Price Displays, and the Keypad/Display Module (Message Center). Each Serial device has a unique device address so when the 748 Controller sends a message on the buss, only one of the Serial devices will respond. Serial devices will not transmit a message on the buss until polled by the 748 Controller.

The Serial hardware interface is based on the EIA standard RS485 specification. The control buss consists of one pair of RS485 signals designated 'A' and 'B'. These signals are 5 Volt differential signals, meaning that whenever 'A' is 0 Volts, 'B' is +5 Volts, and whenever 'A' is +5 Volts, 'B' is 0 Volts.

Communications on the Serial buss are asynchronous half-duplex such that only one device may transmit at a time. Transmission characteristics are as follows:

19200 baud, 7 data bits, even parity, 1 stop bit.

Check List

When a problem occurs, always look for the obvious solution first. Check the following before attempting to make any adjustment or replace any parts.

- Check that the machine is connected to a live power source with a good ground.
- Check that the main power switch is on.
- Check the condition of both circuit breakers on the main power switch assembly and the two circuit breakers on the lower center panel of the cabinet.
- Check that all plugs are seated in their receptacles.
- Check that connector pins are not bent, broken, or pushed through the back of the connector housing when mated.
- Check that wires are not broken at the connector pins.
- Check to insure the Main Door Interlock Switch and the Refrigeration Interlock Switch both actuate when the Main Door is closed.
- Check all indicator LEDs for proper indications.

Indicator LEDs

Indicator LEDs are provided on the 748 Controller, Credit Module, Refrigeration/Turret Module, and Relay Interface board. The proper LED indication with the 748 operating normally is listed below.

748 Controller

+5V-----On Continuous
RL STATUS -----On Continuous

Credit Module

+5VOn ----- Continuous
RL TX ----- Fast Blinking
STATUS --- ----- Depends on the cash system configured, refer to Credit Module Indicators below

Refrigeration/Turret Module

+5V-----On Continuous
RL TX -----Fast Blinking
BACKUP CONTROL ---On Continuous
COMPRESS-----See Refrigeration/ Turret Module Indicators below

Relay Interface Board

LIGHTS-----On Continuous
ENERGY CONTROL---See Relay Interface Indicators below
TURRET INTERLOCK--- On Continuous.

748 Machine Controller Indicators

The 748 machine controller board has two LED indicators: +5 Volts and RL STATUS.

- +5 Volts - This LED will be lit continuously indicating the +5 Volt on board power supply circuit is working properly.
- RL STATUS - This LED indicates the status of the Serial bus.
- On Continuous - indicates that all four Serial devices are communicating with the 748 controller.
- Fast Flashing - indicates that there is a fault on the Serial bus such that none of the Serial devices can communicate.
- Slow Flashing - indicates a failure to communicate with one or more Serial devices. A code (the number of flashes) indicates which device is not communicating. If more than one device is not communicating, the LED will flash each code for each non-communicating device.
 - 1 flash - Column price displays
 - 2 flashes - Message center
 - 3 flashes - Refrigeration/Turret Module
 - 4 flashes - Credit Module

Credit Module Indicators

The Credit module board has three LED indicators: +5 Volts, RL Tx, and STATUS.

- +5 Volts - This LED will be lit continuously indicating the +5 Volt on board power supply circuit is working properly.
- RL Tx - When this LED is flashing (very fast flashes), it indicates that the Credit module is communicating on the Serial bus.
- STATUS - This LED will flash (very fast flashes) to indicate communication is taking place with MDB peripherals or Protocol A devices if connected and properly configured. When the DUMB cash system is configured, the STATUS LED will flash whenever the coin return lever is pushed, a coin is accepted, a tube status response, or a bill is accepted.

Refrigeration/Turret Module Indicators

The Refrigeration/Turret module board has four LED indicators: +5 Volts, RL Tx, Backup Control, and Compressor LED.

- +5 Volts - This LED will be lit continuously indicating the +5 Volt on board power supply circuit is working properly.
- RL Tx - When this LED is flashing it indicates that the Refrigeration/Turret module is communicating on the Serial bus.
- Backup Control - When this green LED is lit, the Refrigeration/Turret module is in control of the Refrigeration Unit. If the LED is off, control is transferred to the Backup Thermostat on the Refrigeration Unit.
- Compressor LED - Indicates that the compressor is turned on.

Message Center Indicators

There are no LED indicators on the Message Center. If the display lights up with the proper message, the +5 V is present. The +5 Volt supply to power the Keypad/Display board (Message Center) is supplied by the Credit module.

Column Price Display Indicators

There are no LED indicators on the Column Price display boards. The +24 Volt, +3 Volt, and +5 Volt supplies to power the Column Price display boards are supplied by the 748 controller.

Relay Interface Indicators

There are three LED indicators on the Relay Interface board: LIGHTS, ENERGY CONTROL, and TURRET INTERLOCK.

- LIGHTS - This LED is lit whenever the fluorescent lamps are on.
- ENERGY CONTROL - This LED is lit when-ever the Energy Control relay is on. When this LED is lit, power is being supplied to the heater in the blower assembly that blows air across the delivery doors and the Main Door display glass. Whenever the refrigeration compressor is running, the Energy Control relay will drop out and this LED will turn off.
- TURRET INTERLOCK - This LED will be lit whenever the turret interlock relay is energized. When energized, the turret interlock relay connects the power supplied to the turret motor so it can turn. The turret interlock relay will be energized when all 11 delivery doors are fully

closed and all 11 latch levers are in the locked position. When de-energized, power is disconnected from the turret motor so the motor cannot turn.

Power Up Sequence

Upon power up, the column price display will show 11111 in the top window, 22222 in the next window, 3s in the next, and so on. The bottom two windows will show 'A's and 'b's respectively. The displays will remain unchanged until the 748 Controller initializes the column price displays and sends them a message to display something different.

The Message Center will display the message "748 DISPLAY Vx.xx" on power up. This message will remain unchanged until the 748 Controller initializes the Message Center and sends a message to display something different.

When the 748 Controller starts up, it turns on the fluorescent lamps in the machine and sends Serial reset messages to all four Serial devices, Column Price Display, Keypad/Display Module (Message Center), Credit Module, and the Refrigeration/Turret Module. As the power up sequence continues, the Message Center will display:

"AUTOMATIC PRODUCTS",
"SHOWCASE MERCHANDISER",
"748 VERSION x.xx",
"ONE MOMENT".

When the message "ONE MOMENT" appears on the Message Center, all the price display windows will display "----" and the turret will start to rotate to locate the home position. If the turret is already at home, the coin door is open, or the Main Door is open, the turret will not rotate. Upon reaching the home position, the price displays will be updated with the appropriate prices.

Refrigeration System

The self-contained refrigeration system is designed to slide in and out of the vendor as one complete assembly. A standard three-pin AC power cord supplies power to the compressor, evaporator blower, and the condenser fan. The evaporator blower runs continuously while AC power is applied. The condenser fan runs only when the compressor is running. The compressor and condenser fan are controlled by a relay located in the Refrigeration/Turret Module. There is a Refrigeration Interlock Power Switch mounted on the Power Panel in the lower left corner of the 748 cabinet. This switch is activated by closing the Main Door. With the Main Door open, there is no power to refrigeration system. Upon closing the Main Door, there is a one-minute delay before the compressor will be turned on. This prevents quick on/off cycles of the compressor and extends its life.

Printer Setup

A serial printer may be connected to the 748 to print out audit information and history logs. The serial printer must be configured as follows:

Baud Rate:	600 to 19200
Data bit length:	8
Parity:	None
Stop bits:	1

The baud rate of the printer must match the baud rate set up in the 748. The default baud rate is set to 9600. See *Section 3* to change the baud rate in the 748.

APi recommends the Seiko DPU-411-21BU Serial printer for retrieving audit data and printing history logs. Printer harness, APi part number R-59301800, is required to connect the printer to the controller.

To connect other serial printers a simple 3-wire harness is all that is required to send data to the printer. Refer to the Owner's Manual for the printer you wish to use for proper connections.

Below are the pinouts of a generic printer harness that may be used.

748 Machine Controller Printer Plug

Connector J1 (DB-9)	25 Pin RS-232
J1-3 (TxD) -----	(RxD) Pin 3
J1-5 (GND) -----	(GND) Pin 7
J1-8 (BUSY) -----	(BUSY) Pin 5

NOTE: RxD on the printer plug may have to be moved from pin 3 to pin 2. BUSY on the printer plug may have to be moved from pin 5 to pin 20. Refer to the Owner's Manual for your specific printer.

OUT OF SERVICE

Whenever an error condition exists that a vend cannot be accomplished, the 748 will go out of service. The fluorescent lamps will be turned off and the Message Center will display "OUT OF SERVICE". Any credit on in the machine will be returned and all money handling devices will be disabled.

When a 748 is out of service, upon opening the coin door, " - - - ERRORS EXIST - - -" is displayed on the Message Center. The process to view current errors is on page 3-2. See "Error Messages" below for further information on specific error messages.

ERROR MESSAGES

Whenever a condition exists such that accepting money and making a vend cannot be accomplished, the 748 will go out of service and an error message is stored in the Error History Log. When the coin door is opened, " - - - ERRORS EXIST - - -" is displayed on the Message Center. The process on how to view current errors is on page 3-2. Below is a list of possible error messages.

HISTORY LOG MESSAGES

There are two types of history events: Shutdown system events and non-shutdown system errors. A History message will be logged whenever a significant event occurs such as "MAIN DOOR OPEN" or "POWER UP TIME" (See Chart on page 4 -15 for a full description of History messages.) Some events will cause the machine to go out of service, but the machine will recover when the condition is no longer present. These events will be recorded in the History log. (See troubleshooting chart to diagnose these problems). A non-shutdown error will cause some portion of the machine to fail but not affect the overall operation. For example: the Bill Validator could go out of service, but the Coin Mech continues to operate. The machine will not be shutdown, but a History Event will be logged. When the coin door is opened, "CHECK HISTORY LOG" is displayed on the Message Center, if an event that requires operator attention has been logged. A list of History messages and their causes is on page 4-15.

TURRET MOTOR ERRORS

Upon power up, turret motor zero position is reset and needs to be located. The zero position is indicated via the activation of a magnetic switch mounted on the Main Door by a magnet mounted on the turret. The Main Door must be closed to find the zero position. The zero position will also need to be found if any motor error occurs either in vend mode or service mode.

NOTE: Each time the machine is turned ON, the turret will rotate until zero position is located. An error message will be generated if the zero position cannot be located.

If the error occurred in vend mode, the machine will be put out of service, the motor will be disabled, and the error message will be inserted into the error queue.

If the error happens while in service mode, a temporary error message will be displayed. Another temporary error message will appear each time the turret motor is turned until zero position is located again.

If a motor error occurred while the service switch is on, the temporary message will be displayed and the motor will be stopped. To restart the motor, the service switch must be turned off and then on again.

DC Resistance

If the troubleshooting chart indicates a motor or a solenoid malfunction, test the coil with an ohmmeter as instructed below.

Resistance	(Ohms $\pm 10\%$)
Door Latch Solenoid P/N R-28212801	41.5 Ohms
Transport Motor P/N R-54801815	10 Ohms

COIN MECH PROBLEMS

If the machine has been set up with a coin mech selected and the free vend option is off, then the Coin Mech must be installed and operating.

On power up and each time the coin compartment door is closed (except with Exec Mechs), the 748 Control attempts to communicate with the Coin Mech. If a valid message is not received, the machine will go out of service with the error "CM NO COMM".

See "DOES NOT ACCEPT COINS" in the Troubleshooting Chart later in this section for more information on troubleshooting this problem.

POWER-UP INITIALIZATION

The 748 Main Controller Board features 8 Kbytes of battery backup RAM enabling the software to "remember" prices, machine option settings, and MIS information if power to the 748 is interrupted for any amount of time.

The advertised approximate life of this battery is 10 years. When power to the machine is restored, the prices, options, and MIS information are the same as when the power was lost.

Each time the 748 Main Controller is powered up, three tests are executed to determine if initialization is necessary. One test examines two memory locations for a specific test pattern. One test performs a memory checksum calculation on the 748 Main Controller battery backup RAM. One test performs a memory checksum calculation on the 748 Main Controller EPROM.

If the test pattern test fails, a software initialization will take place. All options are set back to the factory default settings, the non-resettable MIS information is cleared, and the prices are set back to factory defaults. The default prices are \$99.95 for all shelves.

If the battery backup RAM checksum test fails, the 748 will go out of service. The "OUT OF SERVICE" message will be displayed and the lights will turn off. The refrigeration unit will still continue to operate and will keep the food compartment at the default temperature settings of 34 to 41°F. When the Coin Door is opened, the " - - - ERRORS EXIST - - -" message will be displayed. The error will be "RAM CHECKSUM ERROR" and will require the operator to check all machine options for corrupt settings. The operator may choose to perform a Full Initialization, which will return the machine to the factory default settings. Instructions on how to perform a Full Initialization may be found under *Diagnostics* in Section 3. Refer to the "RAM CHECKSUM ERROR" in the Troubleshooting chart for diagnosing the cause this problem.

If the EPROM checksum test fails, the 748 Main Controller Board will not run. The Price Display and Message Center will display their default startup messages. The refrigeration unit will still continue to operate and will keep the food compartment at the default temperature settings of 34 to 41°F. The RL Tx LED, which is normally lit continuously, will not be lit.

REFRIGERATION SYSTEM

If the Refrigeration System compressor is inoperative, perform the following checks before replacing the unit. Be sure to hold the Refrigeration Interlock Switch closed when making the operational checks.

NOTE: When the Refrigeration Interlock Switch is depressed, there is a one-minute power up delay to the compressor circuit.

1. Measure the line voltage. If the line voltage is below 105 volts, the compressor may fail to start or run hot.
2. If the line voltage is correct, check the automatic thermostat operation by connecting a jumper wire across the terminal with power disconnected.
3. The Start Capacitor, Run Capacitor, and Start Relay are best tested by substituting them with know good components. This way, there can be no doubt of test results.
4. Check **Thermal Overload** for continuity.
5. With the motor leads disconnected from the circuits, check the compressor motor windings with a Volt/Ohm meter set on R x 1 scale.

(Readings $\pm 10\%$)

Common to Start 5 Ohms
Common to Run 1 Ohm
Start to Run..... 6 Ohms

6. Check for a grounded winding with a Volt/Ohm meter from the Start Capacitor to the metal casing, and the Run Capacitor to the metal casing. There should be no continuity. If there is, replace the compressor.

COMPRESSOR CIRCUIT SYSTEM

The Compressor Motor is a Two-Value Capacitor Motor. During start-up, both the Running and Starting Capacitor are in the circuit. This makes the total capacitance during start between 98 μF and 113 μF .

The overall effects of a running Capacitor are:

- Increases break down torque 30%
- Reduces full-load current
- Reduces full-load noise
- Increases locked rotor torque 20%
- Increases overall efficiency

The Start Relay contact is normally closed. The Start Relay has a voltage sensitive coil that remains de-energized until the voltage across its coil, caused by the voltage across the Start Winding, exceeds 162 - 175 VAC. At this time the compressor has broken away from the load and is

near its nominal running speed. As the compressor shaft speed increases, the voltage on the Start Winding also increases. When the Start Winding voltage reaches the proper level, the Start Relay coil will energize. This opens the contacts to the Start Capacitor, disconnecting it from the circuit. With the Start capacitor disconnected, the current through the Start Winding will drop 70%. The Bleeder Resistor provides a safe discharge path for any stored charge in the Start Capacitor. Failure to return to the Start Relay and the Control Box to their correct mounting position will cause the motor starting voltages to be altered. This could result in startup problems at low line voltages.

Always secure the Control Box before returning the unit to service.

When power is applied to the black wire, the Evaporator Blower should run immediately.



CAUTION! This is a HIGH Energy Circuit. DO NOT use less than 16 gauge wire or switches rated less than 15 amps. DO NOT connect the jumper wire or switch while power is ON.

Connecting the black wire to the YL/BK wire closed the refrigeration circuit. When the YL/BK wire is hot, the condenser fan and compressor will start to run. Until the compressor rotor shaft reaches a minimum running speed, the start relay contact (Terminal 1 & 2) will remain closed. This allows the Start Capacitor to draw high current through the Start Winding. This creates a high torque at the rotor shaft in order to accelerate the Compressor under load. As the rotor comes up to speed, the voltage on the Start Relay coil (Terminal 2 & 5) will rise. When the minimum running speed is attained, the Start Relay coil will energize and open the circuit to the Start Capacitor. When repairing the refrigeration unit only use EXACT replacement parts for the Start Relay, Run, and Start Capacitors. Failure to do so will void the warranty. Please note the placement of the Start Relay and the Control Box. Both must be returned to the proper orientation. Altering the mounting position for either of these parts will change the starting voltage (Relay, Run, and Start Capacitors).

BACKUP REFRIGERATION UNIT

Refer to 748 System Schematic for refrigeration and backup system. Refer to Refrigeration/Turret Module Schematic for Dead Man Circuit diagram.

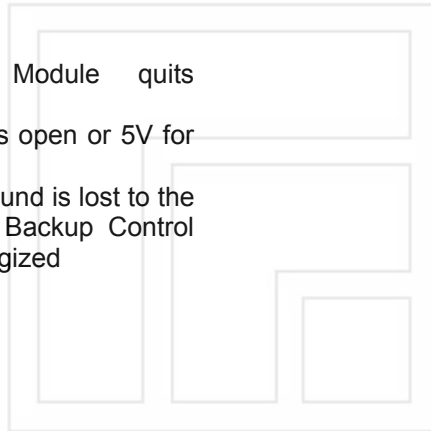
Normal Operation

The Refrigeration/Turret Module has a built-in Dead Man circuit. When the Temperature Sensor and the processor, on the Refrigeration/Turret Module, are both functioning, the processor sends a pulse to the Dead Man circuit. This causes the Dead Man circuit to energize the Back Control Relay. At the same time, the green Backup Control LED will be lit to indicate the system is functioning properly.

Backup Operation

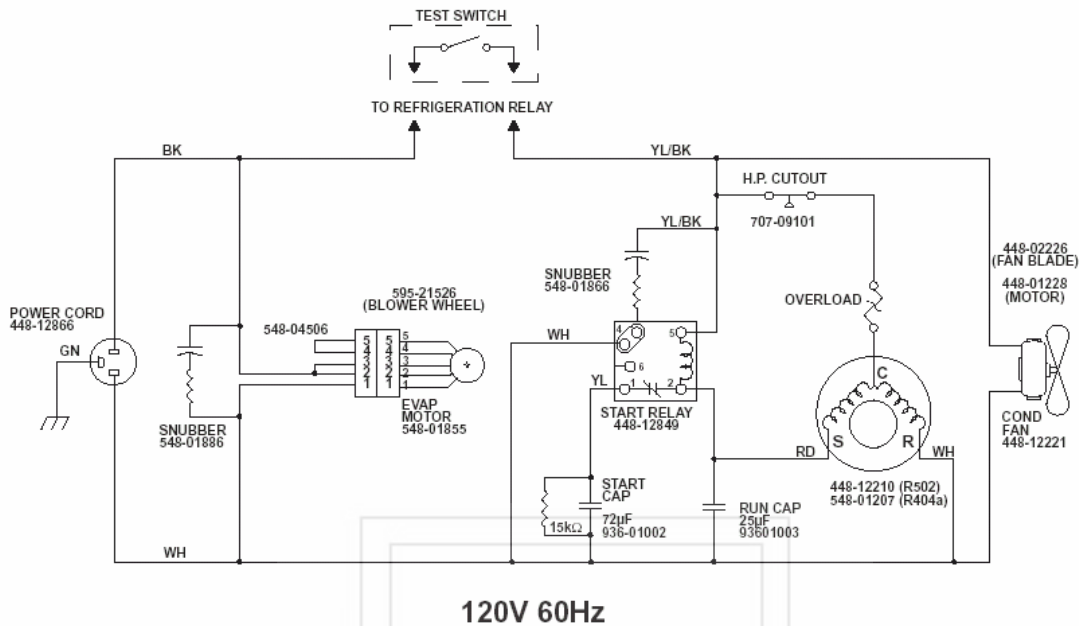
If one of the following symptoms occurs the Backup Control Relay will be de-energized. This will transfer control of the refrigeration unit to the Cold Control Thermostat.

1. The Refrigeration/Turret Module quits functioning for about one minute.
2. The Temperature Sensor reads open or 5V for about one minute.
3. If the 24 VDC or the Power Ground is lost to the Refrigeration/Turret Module, the Backup Control Relay will immediately be de-energized



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Figure 4-1. Refrigeration Wiring Diagram (Domestic)



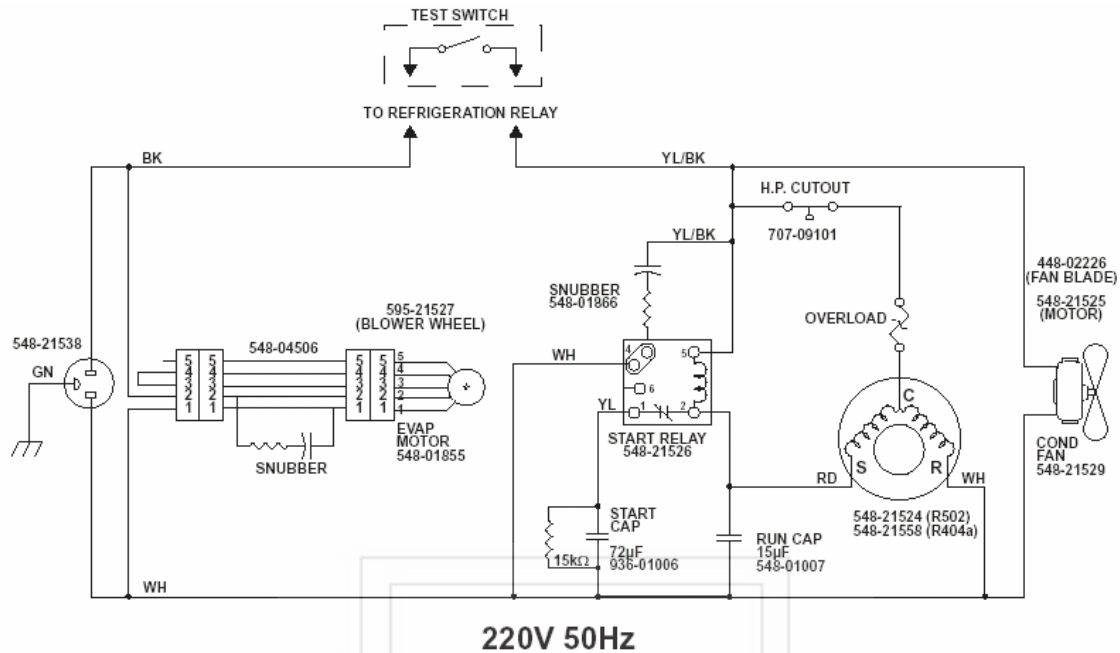
NOTE:

The entire Refrigeration Unit may be removed from the vendor and run on the bench to troubleshoot. Install a jumper wire capable of handling 10A (16 gauge) in the Refrigeration Relay harness connector and plug the power cord into 120V grounded receptacle. Do not allow unit to run for an extended period of time without the Cold Control. It could cause the Evaporator to freeze.



CAUTION! Protective eye wear must be worn when testing refrigeration systems. This system is charged with 13.5 oz. of R404a refrigerant. Repair should only be performed by technician trained and experienced in refrigeration troubleshooting and safety procedures. Never introduce other refrigerants into this system. Operating temperature/pressure will be affected and the unit will not function properly and could be destroyed.

Figure 4-2. Refrigeration Wiring Diagram (Export)



NOTE:

The entire Refrigeration Unit may be removed from the vendor and run on the bench to troubleshoot. Install a jumper wire capable of handling 10A (16 gauge) in the Refrigeration Relay harness connector and plug the power cord into 220/240V grounded receptacle. Do not allow unit to run for an extended period of time without the Cold Control. It could cause the Evaporator to freeze.



CAUTION! Protective eye wear must be worn when testing refrigeration systems. This system is charged with 13.5 oz. of R404a refrigerant. Repair should only be performed by technician trained and experienced in refrigeration troubleshooting and safety procedures. Never introduce other refrigerants into this system. Operating temperature/pressure will be affected and the unit will not function properly and could be destroyed.

ERROR MESSAGES

Error Message	Error Description	Possible Cause and Solution
CDT BD NO COMM	Credit Module lost Serial communication with the 748 controller	Check plugs and harnessing. Check for power. Replace Credit Module.
TRT BD NO COMM	Refrigeration/Turret Module lost Serial communication with the 748 controller	Check plugs and harnessing. Check for power. Replace Refrigeration/Turret Module.
KPD BD NO COMM	Message Center lost Serial communication with the 748 controller	Check Credit Module indicator LEDs. If abnormal, troubleshoot Credit Module first. Check plugs and harnessing. Replace Message Center.
PRC BD NO COMM	Column Price display lost communication with the 748 controller	Check plugs and harnessing. Replace top Price display Board.
CM NO COMM	No communication with the coin mech	Recycle power. Check plugs and harnessing. Check for correct cash system type setup. Replace Coin Mech. Replace Credit Module.
CM TUBE FAULT	Defective coin tube sensor	Re-seat coin magazine. Replace Coin Mech.
CM COIN JAM	Coin lodged in coin mech	Check Coin Mech for jam. Clean Coin Mech. Replace Coin Mech.
HEALTH TIME OUT	Food compartment temperature exceeded maximum health temperature for more than 15 History	Temporary loss of power or loss of Serial communication to Turret minutes Module. Check Logs. Refrigeration Unit not plugged in. Dirty filter screen. Dirty condenser. Machine too close to the wall. Main door latch adjustment too loose. Excessively high ambient temperature. Faulty Temp Sensor. Faulty Refrigeration/Turret Module. Replace. Faulty Refrigeration Unit.
BAD TEMP PROBE	Temperature reading from the sensor is out of normal range	Check plugs and harnessing. Replace temperature sensor. Replace Refrigeration/Turret Module.

Error Message	Error Description	Possible Cause and Solution
MAIN DOOR OPEN	Main door detected open when the coin door was closed	Check switch adjustment, plugs, and harnessing. Replace switch. Check switch inputs (<i>see Inputs in Section 3</i>). If bad, replace 748 Controller Board.
VEND SOL STUCK	A delivery door lock latch is stuck in the open position	Check for stuck switch or open switch. Check for binding in latch mechanism. Check switch harnessing for opens. Check solenoid harnessing for shorts. Check controller for defective solenoid driver. Replace controller board.
0 POSITION ERROR	Unable to locate zero position or lost zero position	Check Turret Interlock system. Check zero position switch, plugs, and harnessing. Possible turret motor error. Check magnet on top of turret. Check turret motor and half cycle switch. Check zero position switch input (<i>see Inputs in Section 3.</i>) If bad, replace Controller Board.
TRT NEVER LEFT	Half cycle switch did not open	Check Turret motor fuse. Check Turret motor resistance.
TRT NEVER RETURN	Half cycle switch opened but did not close again	Check Turret motor plugs and harnessing. Check half cycle switch plugs and harnessing. Check/replace half cycle switch Replace Refrigeration/Turret Module.
TRT TIMEOUT	Control sent move command via Serial to Refrigeration/Turret Module, and the Refrigeration/Turret Module did not respond with either, the turret went off position, did not respond that the turret is on the next position, or an error condition.	Verify that the SerialLink is functioning.
RAM CHCKSM ERROR	When the Main Controller Module powered up, the RAM did not match check sum.	Do full initialization, cycle power several times to verify RAM checks are OK. Replace Controller.
DRIVER OVER TEMP	Turret Driver on Refrigeration/Turret Module is reporting an overheat condition.	Check for short or low DC resistance to turret motor. Replace Refrigeration/Turret Module.
MTR OVER CURRENT	Turret motor draws too much current or turret motor driver.	Check for product jammed in turret. Check harnessing for shorts. Check turret for binding. Check drive shaft and bearing for binding. Replace turret motor. Replace Refrigeration/Turret Module.

HISTORY EVENTS

Event	Description and Solutions
DEFAULTS LOADED	When Controller performed Full Initialization.
MAIN DOOR OPEN	When the Main Door was opened.
MAIN DOOR CLOSE	When the Main Door was closed.
POWER UP TIME	Time at which power was restored to machine.
POWER DOWN TIME	Time power was lost to machine.
PRC BD NO COMM	Center Price Display board lost RL communication. See PRC BD NO COMM error in this section.
KPD BD NO COMM	Keypad Display (Message Center) lost RL communication. See KPD BD NO COMM error in this section.
TRT BD NO COMM	Refrigeration/Turret Module lost RL communication. See TRT BD NO COMM error in this section.
CDT BD NO COMM	Credit Module lost RL communication. See CDT BD NO COMM error in this section.
COMM RESTORED	This Event is logged when a previously lost RL COMM was restored. This will also be the time at which the machine self recovered from the Serial Error.
BA CREDIT STUC	The Credit line on the Pulse Bill Acceptor went active and never returned inactive. See B.A. Creditline Stuck in troubleshooting of this section.
BA STACKER FULL	The Bill Acceptor has reported that it stacker is full. Empty stacker and cycle machine power.
BA BILL JAM	The Bill Acceptor reported a Bill Jam. Clear Bill Acceptor and cycle machine power.
BA FAULT	General Bill Acceptor Fault. Refer to Bill Acceptor's Manual for troubleshooting.
CARD RDR NO COMM	The MDB Card Reader has Lost Communication. See CARD NO COMM in troubleshooting of this section.
CARD RDR NDS SRVC	The card reader requires service. Refer to the Card Reader's Owners Manual for service instructions.
CARD RDR FAULT	General Card Reader Fault. Refer to the Card Reader's Owners Manual for service instructions.
ERRORS CLEARED	This event is logged when CLEAR ERRORS was saved to YES and service mode was properly exited.
HEALTH ERR CLRDR	This event is logged, along with an ERRORS CLEARED event, when a Health Error is Properly cleared.
TRT LOST SYN	This event occurs when the Refrigeration/Turret Module does not report the turret at the same position as the Main Controller. Probable cause is temporary power loss to the Refrigeration/Turret Module. Check plugs and harnessing.
TRT OVERRUN	The turret did not stop properly on the next turret position and over shoot the 1/2 cycle switch. This is possible in a loaded turret if a Delivery Door is opened as the turret is coming to the next position. Repeated logging of this error might suggest attempted machine tampering or intermittent 1/2 cycle switch problems (see TRT NEVER LEFT error in this section). The machine will recover from this by automatically finding the Zero Position, if in operating mode. In service mode the TURN TILL ZERO prompt will appear.

TROUBLESHOOTING CHART

Problem	Probable Cause	Solution
Message Center does not light	No power to the Message Center	Check for +5VDC. Check for GND. Above voltage is required for the Message Center to light. There is only one cable to the Message Center. This comes from the Credit Module. If the Controller dies but the power is still on the Message Center, the Message Center will default to the built in message "748 DISPLAY Vx.xx"
Price Column Display does not light	Missing power	Check power from Controller 24VDC (pins 4 & 5) to GND (pin 14) and FIL +3V (pins 1 & 2) to FIL GND (pins 9 & 10).
	Harness/Connector problem	Check from Controller (P1) to Display (P1).
	Defective Column Display	Replace Column Display.
Does not accept coins	Improper Cash System setup	Verify proper setup (<i>see Section 3</i>).
	Missing power	Check for 24VAC on the Credit Module (P8 pins 1 & 5). Check for 24VPDC on Credit Module (P8 pins 2 & 3).
	Harness/Connector problem	Check Coin Mech harness between Credit Module and Coin Mech.
	Defective Coin Mech	Replace Coin Mech.
	Defective Credit Module	Replace Credit Module.
BA Creditline stuck	Pulse BA Creditline went to Ground and did not return to 5V.	Check for harness short to Gnd. Replace Bill Acceptor Replace Credit Module.
Does not attempt bill acceptance	Improper Cash System setup	Verify proper setup (<i>see Section 3</i>).
	Missing power	Check Credit Module indicators. Check for B/A power.
	Coin Mech change level low	Add change to Coin Mech.
	Improper coin loading technique	See <i>Coin Tubes</i> in <i>Section 3</i> .
	Harness/Connector problem	Check I/O Credit Module to B/A.
	Defective Bill Acceptor	Replace Bill Acceptor.
	Defective Credit Module	Replace Credit Module.

Problem	Probable Cause	Solution										
Does not register credit	<p>Improper setup</p> <p>Credit messages not received from Coin Mech</p> <p>Service Door switch not closed</p> <p>Coin Mech defective</p> <p>Credit Module defective</p>	<p>Verify proper setup (<i>see Section 3</i>).</p> <p>No continuity between Credit Module and Coin Mech.</p> <p>Check for defective actuator.</p> <p>Replace Coin Mech.</p> <p>Replace Credit Module.</p>										
Does not give change	<p>Dollar coins in MIS</p> <p>Coin Mech misprogrammed</p> <p>Dispense lines to Coin Mech disconnected (DUMB Mech)</p> <p>Defective Coin Mech</p> <p>Defective Credit Module</p>	<p>Empty dollar coins (<i>see Coin Tubes in Section 3</i>).</p> <p>Reload Coin Mech.</p> <p>Check continuity between:</p> <table border="0"> <tr> <td><u>Credit Module</u></td> <td><u>Coin Mech</u></td> </tr> <tr> <td>pin 10</td> <td>pin 9</td> </tr> <tr> <td>pin 9</td> <td>pin 8</td> </tr> <tr> <td>pin 8</td> <td>pin 7</td> </tr> <tr> <td>pin 7</td> <td>pin 14</td> </tr> </table> <p>Replace Coin Mech.</p> <p>Replace Credit Module.</p>	<u>Credit Module</u>	<u>Coin Mech</u>	pin 10	pin 9	pin 9	pin 8	pin 8	pin 7	pin 7	pin 14
<u>Credit Module</u>	<u>Coin Mech</u>											
pin 10	pin 9											
pin 9	pin 8											
pin 8	pin 7											
pin 7	pin 14											
CARD RDR NO COMM	Communication to the card reader was lost.	<p>Check plugs and harnessing. If multiple MDB devices are not communicating, replace Credit Module.</p> <p>Replace Card Reader.</p>										
Turret does not rotate	<p>Turret overload or jammed</p> <p>Delivery Door opened or door unlocked</p> <p>Harness/Connector problems</p> <p>No signal from Message Center</p> <p>Defective Refrigeration/Turret Module</p>	<p>Remove obstruction.</p> <p>Check interlock relay on Relay Interface Board.</p> <p>Check terminals on motor. Check motor resistance. (<i>see Table 4-1: Resistance Chart</i>)</p> <p>Check Refrigeration/Turret Module (P1) to motor terminals</p> <p>Check from Controller (P1) to Display (P1).</p> <p>Check Controller indicators for Refrigeration/Turret or Message Center RL problems.</p> <p>Replace defective Message Center.</p> <p>Replace Refrigeration/Turret Module.</p>										

Problem	Probable Cause	Solution
Turret only turns one direction	DC Motor defective Message Center Rocker Switch defective Defective Refrigeration/Turret Module	Check for 24VDC across motor. If present, replace. Replace message Center. Replace Refrigeration/Turret Module.
Turret rotates constantly (Main Door closed)	Key stuck on Message Center	Disconnect harness from Message Center. If turret stops, replace Message Center.
Turret rotates constantly (Main Door opened)	Service Switch defective or shorted to door	Check switch. Perform continuity test between switch and door chassis for wire short.
Turret stops between lobes on cam	Half cycle switch defective or wiring defective, or unplugged	Check switch for adjustment and wiring for continuity.
Delivery Door does not open	Turret out of position and/or in FIFO mode Compartments in sold condition Invalid section lockout Harness/Connector problem Defective solenoid Defective door switch Missing 24VDC power Defective Controller	Check turret position. Set Zero Position routine in the Diagnostic Menu. Reprogram Shelf Mode. Rotate the turret one full revolution with inside Service Switch. Check the Sold Out Check program in Options Menu (see Section 3). Check the turret program (see Section 3). Check harness to Controller from solenoid. Check solenoid resistance (see Table 4-1). Check switch inputs (see Diagnostic Menu in Section 4). Measure Controller P5 pin 1 to P5 pin 2. Should be 24VDC. Replace Controller.

Problem	Probable Cause	Solution
Refrigeration inoperative	Refrigeration unplugged or no power Refrigeration relay unplugged Refrigeration overload Relay (control) defective	Check and replug. Connect Refrigeration relay. Clean screen and condenser coils. If (A & B) hold true, A. Back up control LED and Compressor LED are both lit. B. Refrigeration unit does not power up. Perform the following: Turn power off. Short together the (blk) and (yl/blk) wire on the Refrigeration relay. Turn power on. If Refrigeration Unit now powers up, replace the Refrigeration/Turret Module.
Compressor does not start	No voltage on (blk) wire with Evaporator/Blower not running No voltage on (yl/bk) wire Low line voltage Start Relay contacts defective Motor overload defective Start Capacitor defective Compressor head load too high	Defective Refrigeration unit line cord. Check and/or replace Refrigeration/Turret Module. Check voltage. It should be 105V minimum with Compressor running. Replace Start Relay. Check and replace. Check and replace. Allow 3 minutes off time for pressure equalization before restarting and performing pressure checks.

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Problem	Probable Cause	Solution
Compressor runs hot and trips overload	<p>Compressor Start Winding defective NOTE: Motor will start with Run capacitor removed or open.</p> <p>Air intake screen clogged or obstructed.</p> <p>Condenser coils blocked</p> <p>Condenser fan not running</p> <p>Start Relay not opening – defective</p> <p>Run Capacitor not in circuit</p> <p>Run Capacitor defective</p> <p>Low line voltage</p> <p>Low refrigerant charge</p>	<p>Perform compressor Ohm test. If test fails, replace Compressor, Start Relay, Start Capacitor, and Run Capacitor.</p> <p>Clean as necessary.</p> <p>Clean as necessary.</p> <p>Remove obstruction or replace.</p> <p>Check and replace.</p> <p>Check and install.</p> <p>Check and replace.</p> <p>Check voltage. It should be 105V minimum with compressor running.</p> <p>Allow 3 minutes off time for pressure equalization before restarting and performing pressure checks.</p>

CONTROLLER SERIAL LINK STATUS LED TROUBLESHOOTING

Problem	Probable Cause	Solution
Credit Module (4 flashes) or Turret Module (3 flashes)	No RL communication to module	<p>Verify +5V on module.</p> <p>Check harnessing.</p> <p>Replace module.</p>
Message Center Module (2 flashes) or Column Price Display (1 flash)	No RL communication to module	<p>*Message Center: Verify no Credit Module error. If so, troubleshoot Credit Module first.</p> <p>Verify +5V on module.</p> <p>Check harnessing.</p> <p>Replace module.</p>
Controller Fast Continuous Flashing RL LED	No RL communication to module	<ol style="list-style-type: none"> 1. Verify +5V. 2. Turn power off. 3. Unplug all RL Modules from the Controller (P1, P2, P3, and P4 on the Controller). Plug a known good Message Center into P3. 4. Turn on power if Message Center does not update from the default message. Replace Controller. 5. Else, plug in questionable Message Center into control if RL Tx LED flashed flash continuous. Replace Message Center. Repeat step 5 for each RL module, replacing the module if RL LED flashes fast continuous.
Controller RL Tx LED does not light	Microcomputer not functioning properly	<p>Check +24VDC power on P1 pin 1 and pin 2.</p> <p>Check that EPROM seated properly.</p> <p>Replace Main Controller.</p>

Section 5: Maintenance

INTRODUCTION

This section explains, in general, the Delivery Door/Turret Interlock safety system and certain procedures for component replacement. It also provides information on cleaning and maintenance.

DELIVERY DOOR OPERATION

Each Delivery Door assembly contains a locking/unlocking system, two microswitches, and the Delivery Door return spring (see *Figure 5-1*).

When a customer slides a Delivery Door towards its open position, it will first release the door switch, and a signal will be sent to the Control Computer. This switch is wired so that when it opens, it will automatically cause the Turret Interlock Relay to open, thus positively preventing the drum motor from being energized.

If there is adequate credit (and the item was not previously sold), the control will energize the door unlock solenoid which will retract the door locking block and allow the door to be fully opened.

When the door unlock solenoid is energized, the door unlock switch will provide a signal to the Control to indicate that the door is unlocked. All of the door unlock switches are wired to cause the turret interlock relay to open also; this provides yet a second protection from turret movement while any door might be open.

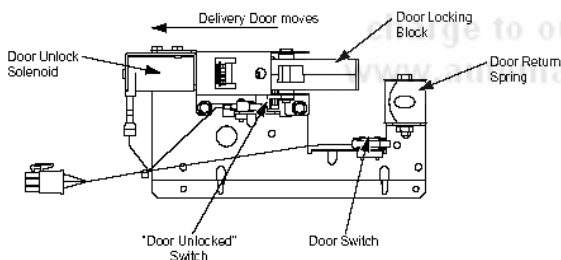


Fig 5-1 - Delivery Door Switch

After the door is opened, there is a delay, after which the Control will release the door unlock solenoid which will cause the door to be locked after it closes again. However, until the customer moves the turret or inserts more money, he/she can reopen the same door again and again without restriction.

CHECKING THE REFRIGERATION SYSTEM



NOTE:

The entire Refrigeration Unit may be removed from the vendor and run on the bench to troubleshoot any given problem. Plug the connector from the Cold Control Thermostat to the connector coming from the Capacitor/Relay box.

DO NOT allow the unit to run for extended periods of time because the Evaporator may freeze.

If the refrigeration system compressor is inoperative, perform the following checks before replacing the compressor. Be sure to hold the Refrigeration Interlock switch closed when making the operational checks.

1. Measure the line voltage. If the line voltage is below 105 volts (for 115 VAC units) or 208 volts (for 220/240 VAC units), the compressor may fail to start.
2. If the line voltage is correct, check the automatic control thermostat operation by connecting a jumper wire across the terminals with the power disconnected. Power back on and verify if compressor runs.
3. The Start Capacitor, Run Capacitor, and Start Relay are best tested by substituting them with known good components. This way there can be no doubt of the test results.
4. Check the Thermal Overload for continuity.
5. Check the compressor motor windings with a Volt/Ohm meter. Set the meter on the R x 1 scale.

(Readings should be within 10% of listed)

Test Points	115Vac	230Vac
Common to Start	5 ohms	11 ohms
Common to Run	1 ohm	2 ohms
Start to Run	6 ohms	8 ohms

6. Check for grounded winding with the Volt/Ohm meter attached between the Start and the metal casing of the compressor. There should be no

continuity. If so replace the compressor. Repeat for the Run side of the compressor.

7. Check the high pressure cut-out switch for continuity. It is located on the compressor discharge line.



CAUTION!

The Refrigeration Unit contains R404a under high pressure. Refrigerant contact with skin should be avoided and protective eyewear must be worn. Repairs should only be attempted by qualified technicians trained and skilled in accepted refrigeration techniques and procedures. Laws in the USA require certification for opening a refrigeration unit for repairs

NEVER introduce other refrigerants into this system. Operating temperatures and pressures will be affected and the refrigeration unit will not operate correctly, possibly damaging the unit.

REPAIR AND REPLACEMENT

Most of the repair and replacement procedures for the Merchandiser are of an obvious nature. The following information is provided to aid service personnel in repairing or replacing parts that require additional information.



CAUTION! To prevent injury of damage to the vendor, two people are required to perform the following procedure.

Turret Removal

1. Empty the Turret of all product to prevent spillage.
2. Rotate the Turret until the “zero position” magnet is facing straight forward, and shut off the Main Power Switch.
3. Empty and remove the four storage racks.
4. Remove the single screw at the base of the dividing wall, then slide it forward and remove.

NOTE:

A long handled 3/8” nut driver (12” or more) with a magnetized head is recommended for step 5.

5. Remove two screws from upper pivot bearing. The bearing and pivot shaft will lay down on top of the turret.

6. Lift the turret assembly straight up high enough for turret base to clear the center bearing and drive helicopter and remove the turret.

7. Reverse this procedure to reinstall the turret.

Delivery Door Removal

1. Remove the left-hand fluorescent lamp and the white cover over the Delivery Door unlatch mechanisms.



CAUTION! The white cover over the delivery door unlatch mechanisms being removed in step 1 of this procedure must be replaced correctly to ensure anti-heat protection.

2. Remove the three screws from the bottom runner of the door being replaced. (One screw on the right end of the runner, two screws on the left side of the Delivery Door opening.)

3. Slide the bottom runner out to the left.

4. Lift the bottom of the door out first, then the top.

5. Unhook the Delivery Door return spring.

6. To replace, reverse the above procedure.

CLEANING

To project the best selling image to the customer, and to prolong the beauty and operation of the vendor, it is important to keep your Showcase Merchandiser clean.

Door Fan Filter

Check and wash out the door fan filter each month or as needed depending on location. If not cleaned for long periods, the efficiency and life expectancy of the fan motor and heating elements will deteriorate.

Unit Exterior

Remove any debris lodged in the Delivery Door runner tracks. Use a clean soft cloth moistened with a mild dishwashing liquid to clean all Delivery Doors and runner tracks. Metal and vinyl surfaces can be cleaned with warm water and a mild non-dulling detergent.

Unit Interior

Remove any debris that may have spilled or dripped into the compartments, interior lining, and shelf areas. Use a clean lint-free cloth, moistened with a mild dishwashing liquid.

Coin Mechanism and Bill Acceptor

Regularly check and clean the coin paths leading through the flight deck and coin tubes. Follow cleaning instructions as supplied by the payment peripheral manufacturer.

Refrigeration System

The refrigeration intake screen should be checked routinely. It is easy to remove with the Main Door open.

The condenser coil and exhaust screen should be checked and cleaned at least once a year. These areas should be checked more often if the location is dusty or dirty.

The entire refrigeration unit needs to be pulled out to clean the condenser coil and exhaust screen. The process of removing the refrigeration unit is simple and easy and should only take about five minutes.

Cleaning the Refrigeration Unit

1. Turn off the main power switch.
2. Remove the screws securing the right refrigeration cover, located at the lower front of the cabinet.
3. Unplug the connector on the power supply panel.
4. Remove the top center screw on the power supply panel and the screw to the right of the right-most power supply hinge, then rotate the power supply forward.
5. Disconnect the refrigeration AC power plug to the refrigeration system, the 3-pin harness connector, and the 2-pin harness connector.
6. Disconnect the 6-pin connector to the transport motor.
7. Disconnect the harness to the backup thermostat.
8. Disconnect the 3-pin harness connector at P4 of the Refrigeration/Turret Control Board.
9. Slide the power supply to the right to remove it from the hinges. Set the power supply aside.
10. Remove the screws securing the front mounting bracket holding the refrigeration unit.
11. Unlatch the left and right side refrigeration unit levers.
12. Slide the entire refrigeration system forward.
13. Clean out any debris in the air return housing.
14. Blow out and clean the condenser coil assembly.
15. Blow out and clean the cabinet rear exhaust screen.

CLEANING SCHEDULE FOR APi 748 Showcase Merchandiser

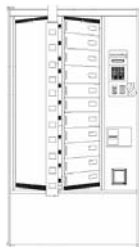
TASK	Each Visit	Monthly	Every 6 months	Every 12 months
Unit interior – spilled or leaking product	X			
Unit Exterior – fingerprints, dirt, etc.	X			
Coin Mech and Bill Acceptor		X*		
Door Fan filter		X*		
Clean air inlet screen		X*		
Exhaust Screen			X*	
Refrigeration system				X*

* More frequent cleaning may be required if location is dusty, dirty, or has a high level of floating particles.

Door Trim & Panels
6.1



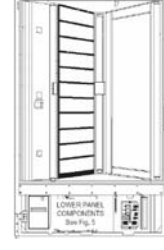
Door Exterior
6.2



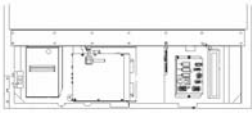
Message Center
6.4



Door Interior
6.6



Lower Main Door
6.8



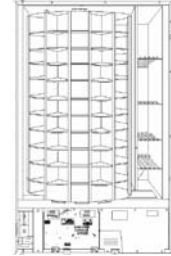
Coin Mech Compartment
6.10



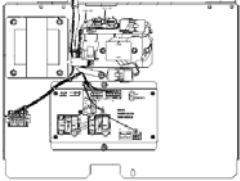
Coin Mech Door Assembly
6.12



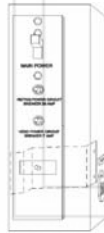
Cabinet Final Assembly
6.14



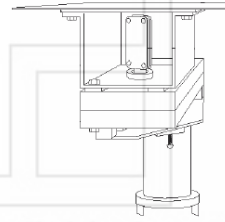
Power Supply
6.18



Main Power Switch
6.20



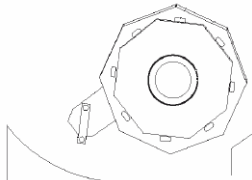
Turret Motor
6.22



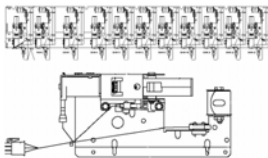
Turret Bottom
6.24



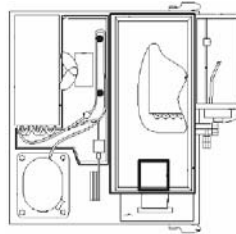
Turret Drive & Roller
6.25



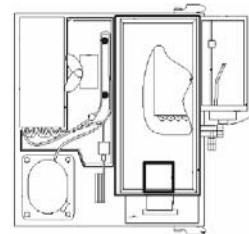
Delivery Door Plate
6.26



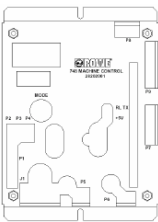
Refrigeration Unit 120V
6.28



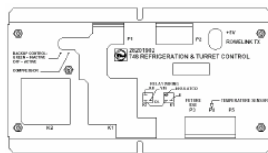
Refrigeration Unit 220V
6.30



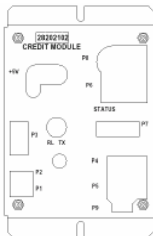
Control Board
6.32



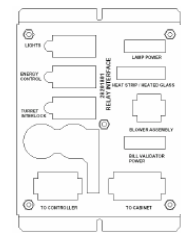
Refridge/Turret Control
6.33



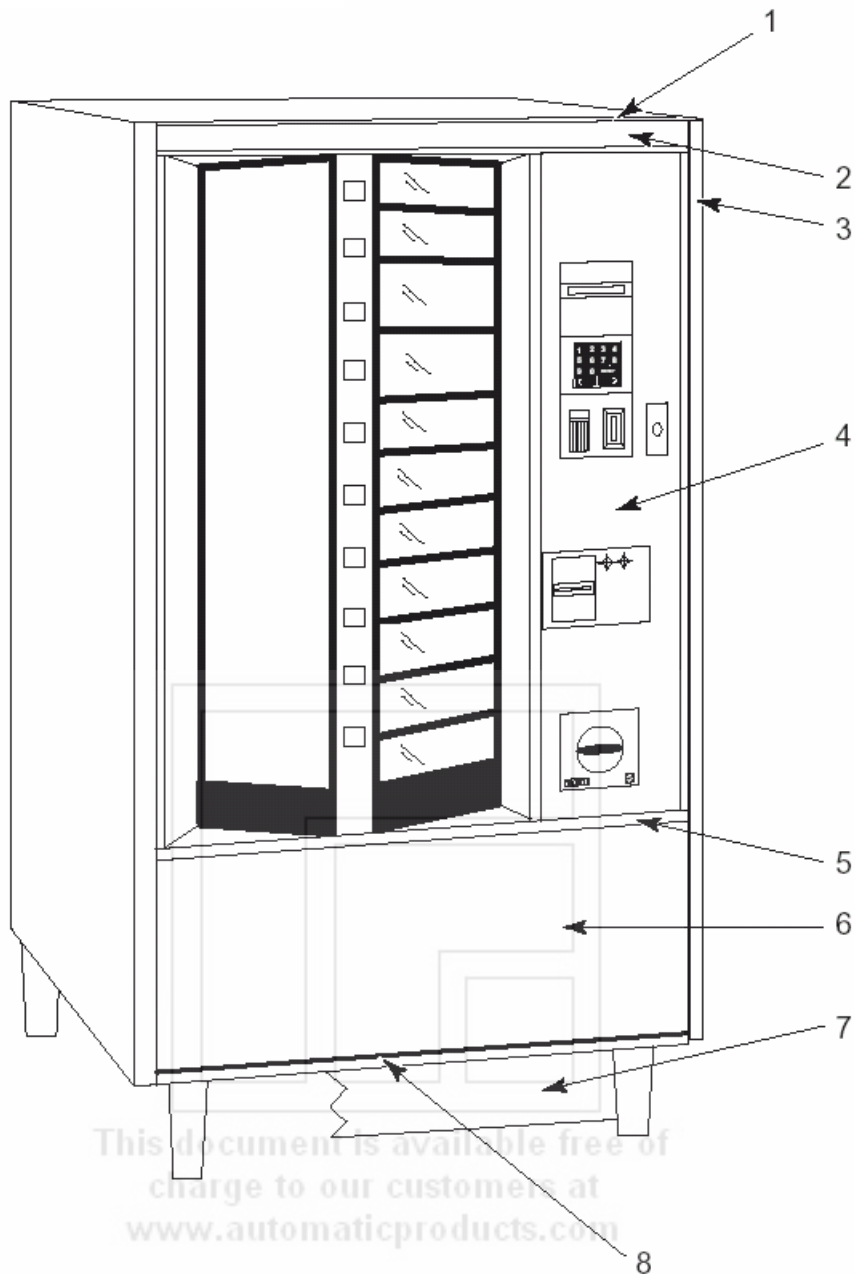
Credit Module
6.34



Talker Module
6.35



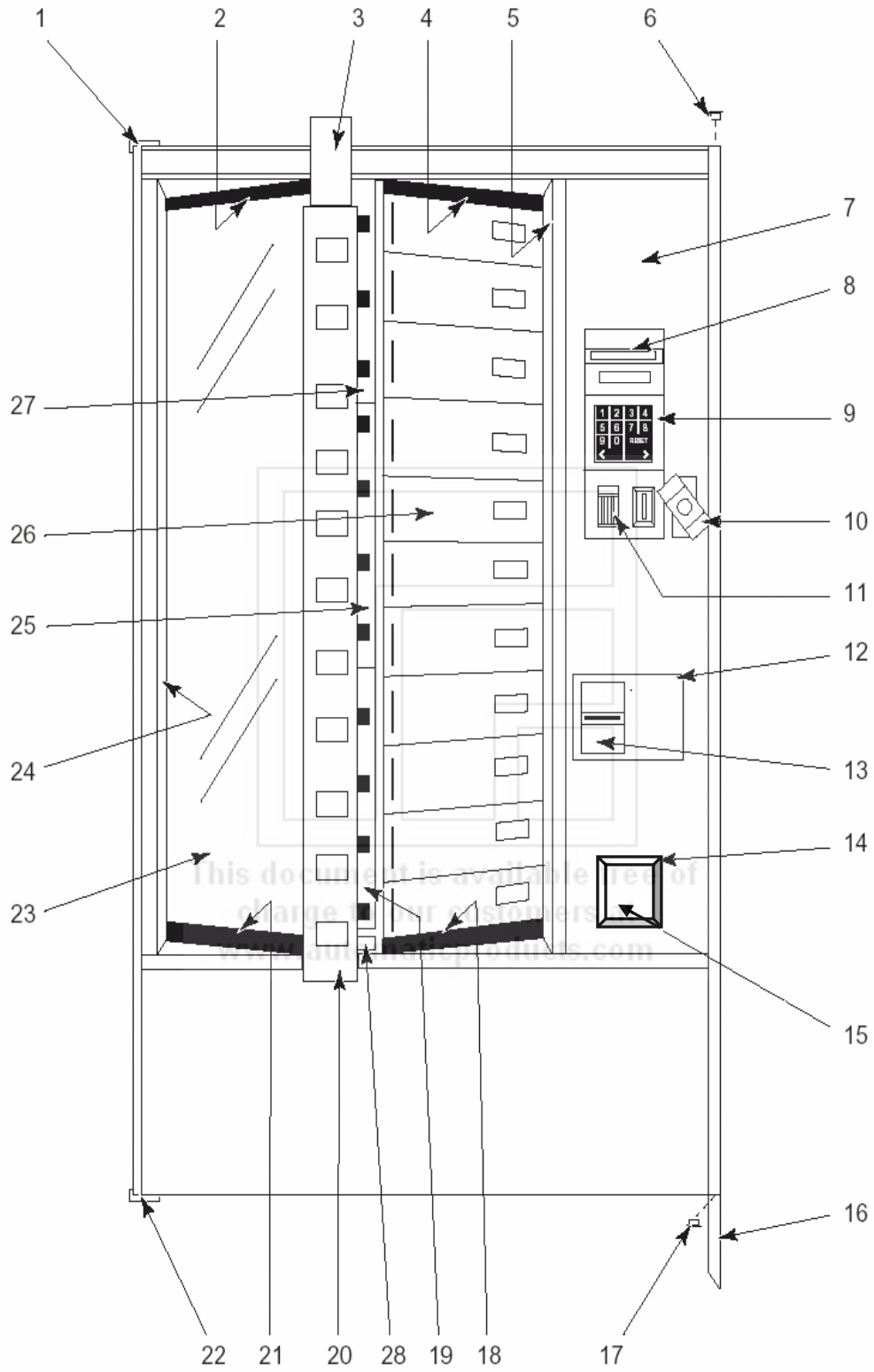
Main Door Trim & Panels



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No	Description	Genesis	Black
1	Channel – Header	98300003	98300003
2	Insert – Header	98500003009	98500003009
3	Trim - Sides Vertical	98300101	98300101
	Trim Retainer – Vertical	98300325	98300325
4	Panel w/ BA	44802531009	44802531009
	Panel w/o BA	44830501009	44830501009
5	Trim – Horizontal	98300224	98300224
	Trim Retainer – Horizontal	98300329	98300329
6	Panel	44812472	98500022009
7	Kickplate (OPT) {Black}	44806028	44806028
8	Trim - Horizontal – Bottom	44800743309	44800743309

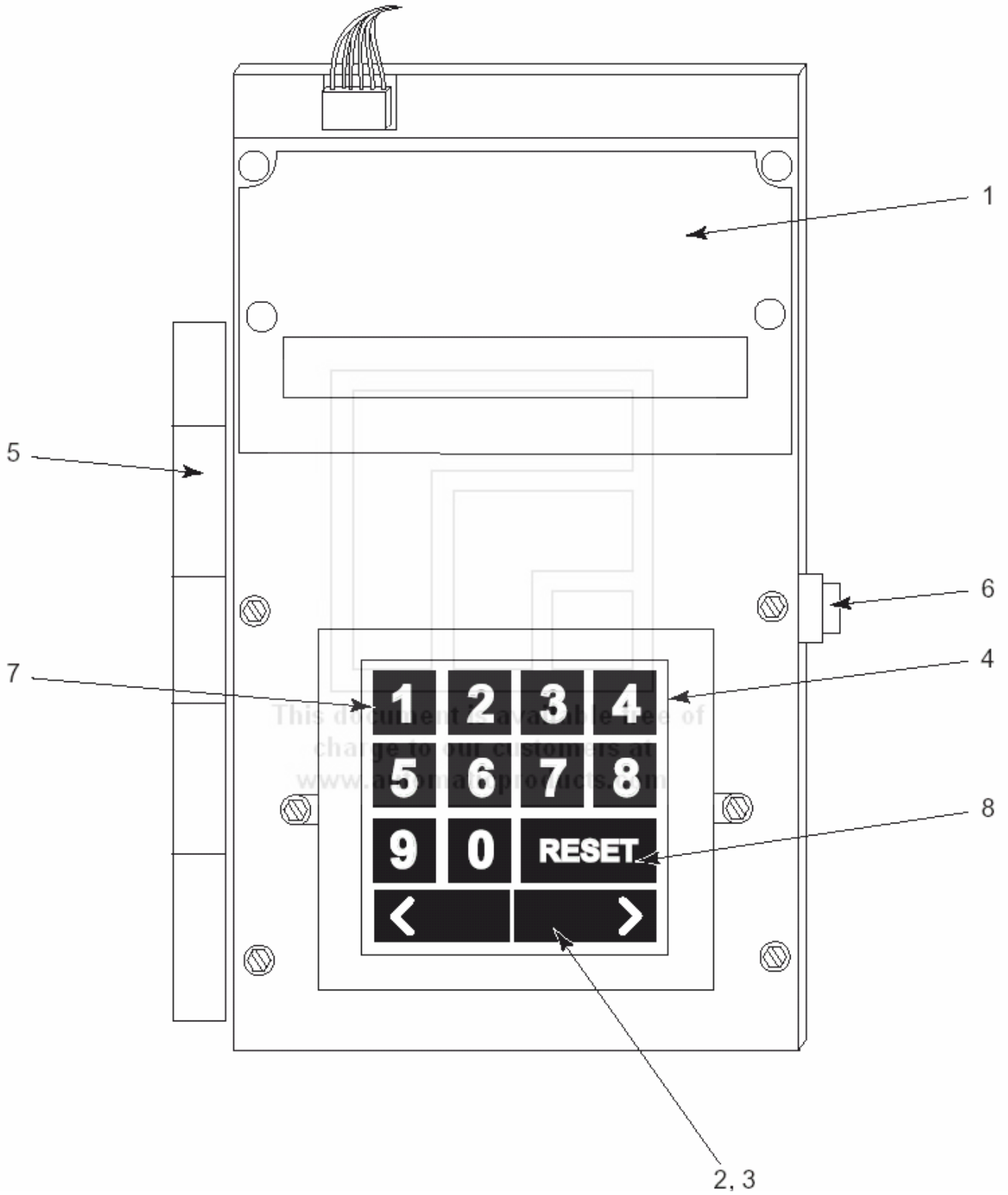
Main Door Exterior



Main Door Exterior

Key	Part Number	Description	Qty
	R-74801420	Main Door Final Assembly (Black)	Ref.
	R-4801401309	Main Door Weld Assembly (Black)	1
1	R-44801309309	Pivot Plate Rivet Assembly	1
	R-92100496	Counter Sunk Screw - Phillips (not shown)	3
2	R-54800411	Glass Extrusion - Top	1
3	R-54800416	Display Lens	1
4	R-54800463	Runner Retainer Extrusion - Top	1
5	R-54800468	Air Duct Panel	1
	R-54800470	Air Duct Seal	1
6	R-40800511	Trim Cap - Top	1
7	76600000	Coin Mech Compartment Door Assembly - No Overlay	1
8	R-50001029	Message Center Assembly (<i>see Page 6.4</i>)	Ref.
9	R-54800534	Coin Insert Bezel	1
	R-92400156	Bezel Mounting Nut (not shown)	6
10	17200002	Pop-Out Handle Assembly	1
	118-10-02	Handle Mounting Carriage Bolt	2
	438-8	Handle Mounting Nut	2
11	R-49000470	Coin Return Slide	1
12	R-54800533001	UBA Bezel	1
	R-70134133	Bezel Mounting Screw	4
	R-54800536	Filler Plate (if UBA is removed)	Alt.
	R-54800537	Backing Plate	1
	438-8	Filler Plate Mounting Nut	4
14	660581	Coin Cup Front Assembly, includes Trim, Door, Pin & Spring	1
	440411	Trim (Black)	1
	440412	Door	1
	300212	Pin	1
	400108	Spring	1
	420144	Ferrule	4
	305-8R6	Screw #8 X 3/8	4
15	202810	Coin Cup Only	1
	12000348	Security plate to Convert Standard Coin Cup to Security Coin Cup	Alt.
	16600280	Security Coin Cup	Alt.
16	R-44800575309	Door Stabilizing Leg	1
17	R-40800510	Trim Cap - Bottom	1
18	R-54800464	Runner Retainer Extrusion - Bottom	1
19	R-28200701	Price Display Assembly - Bottom	1
20	R-54800495	Price Display Extrusion	1
21	R-54800410	Glass Extrusion - Bottom	1
22	R-44801407309	Rivet Assembly Pivot Plate - Bottom	1
	R-92100496	Counter Sunk Screw - Phillips (not shown)	4
23	R-54801800	Heated Glass and Gasket Assembly (<i>see Page 6.6</i>)	1
24	R-54800472	Door Trim - LH	1
25	R-28200501	Price Display Assembly - Center	1
26	R-28216604	Delivery Door - 5"	2
	R-28216601	Delivery Door - 4"	9
27	R-28200301	Price Display Assembly - Top	1
28	R-54800496	Locator PC Board	1
29	17400141	Api Lo	

Message Center

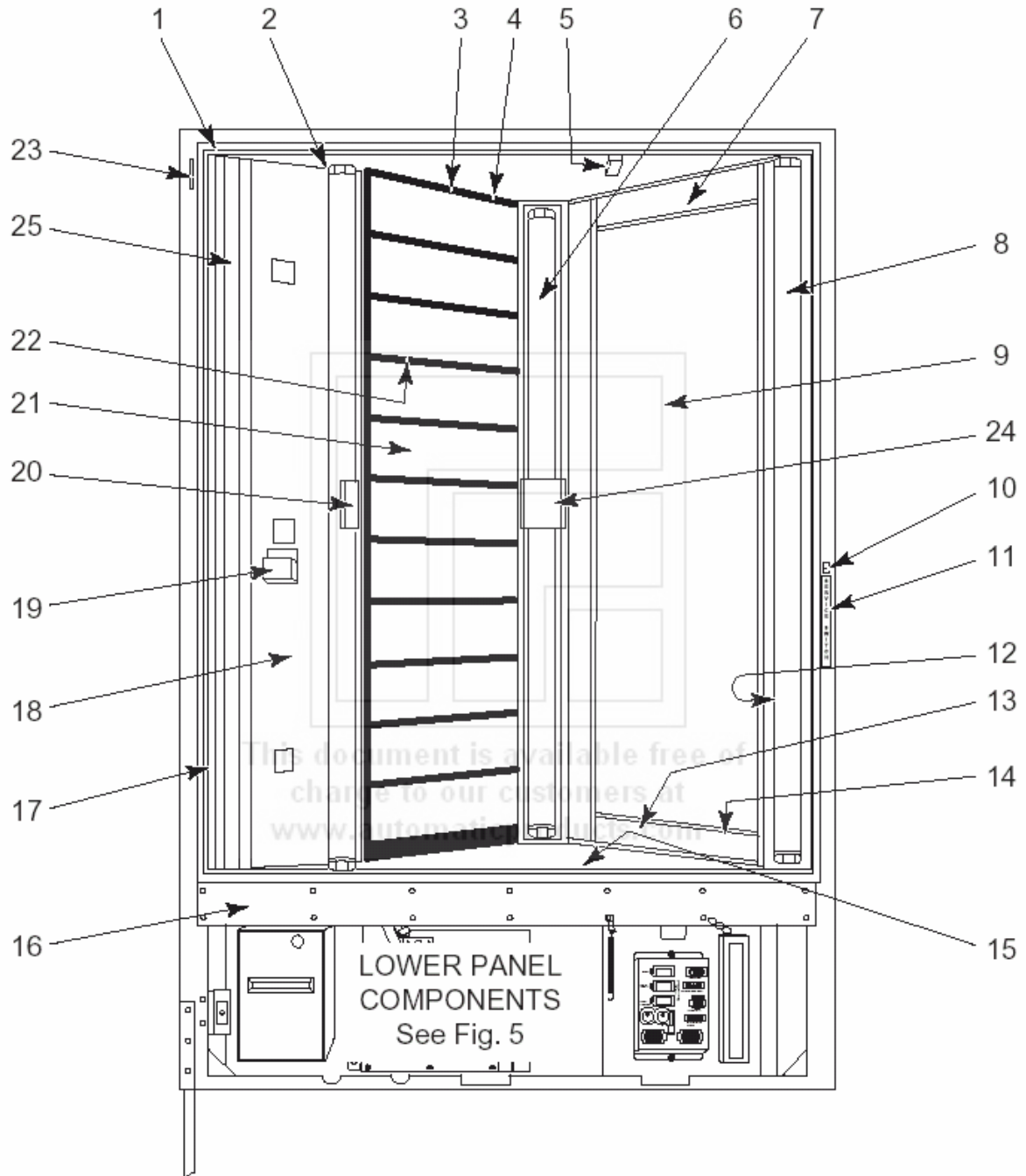


Message Center

Key	Part Number	Description	Qty
	R-50001029	Message Center Assembly	
1	R-50001028	Keypad and Display Assembly	
	R-50000123	PWB - Keyboard	1
	R-50000122	Switch Mounting Plate	1
	R-50000117	Message Center Cover	1
	R-50000101	Keypad Housing	1
	73600000	Display Board	1
	R-91400007	Push Fastener	4
	R-93400307	Screw	5
	R-50001024	Harness Assembly	1
	R-50000121	Message Center Overlay	1
	R-70086612	Header - Connector, 12 Position	1
2	R-90702220	Shelf Rotator Label	1
3	R-54800801	Push Button, Rocker	1
4	R-54800836	748 Push Button Grid	1
5	R-54800432	Message Center Hinge	1
6	R-54800434	Message Center Latch Keeper	1
7	R-30838126	Key Cap Number Set - "0" thru "9" Push Buttons	1
8	R-30743203	Key Cap - "RESET", Horizontal	1

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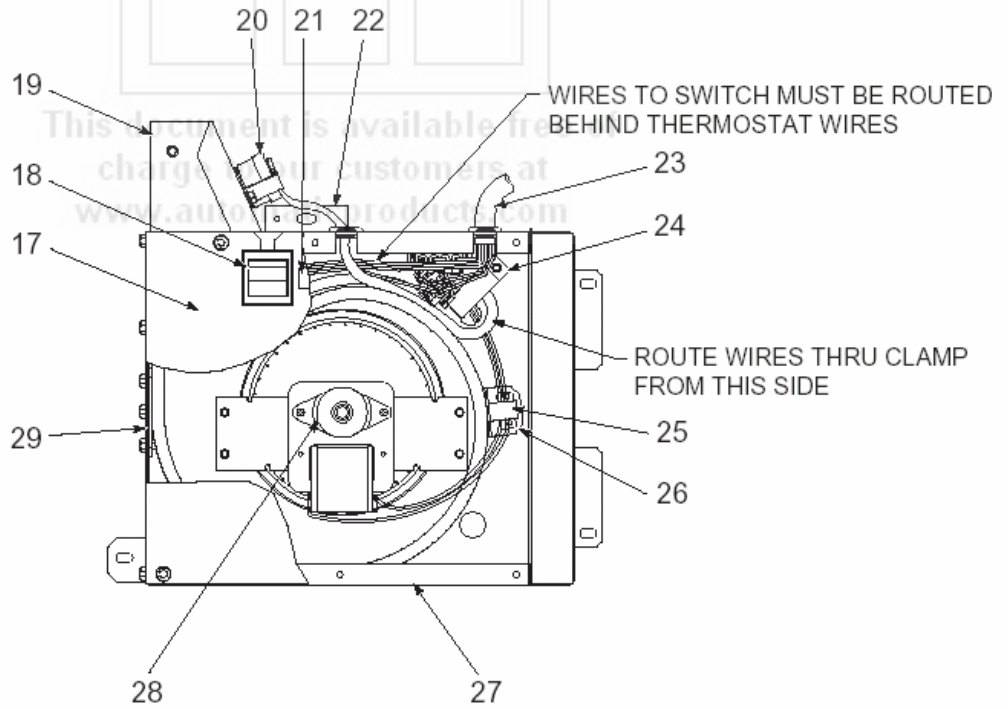
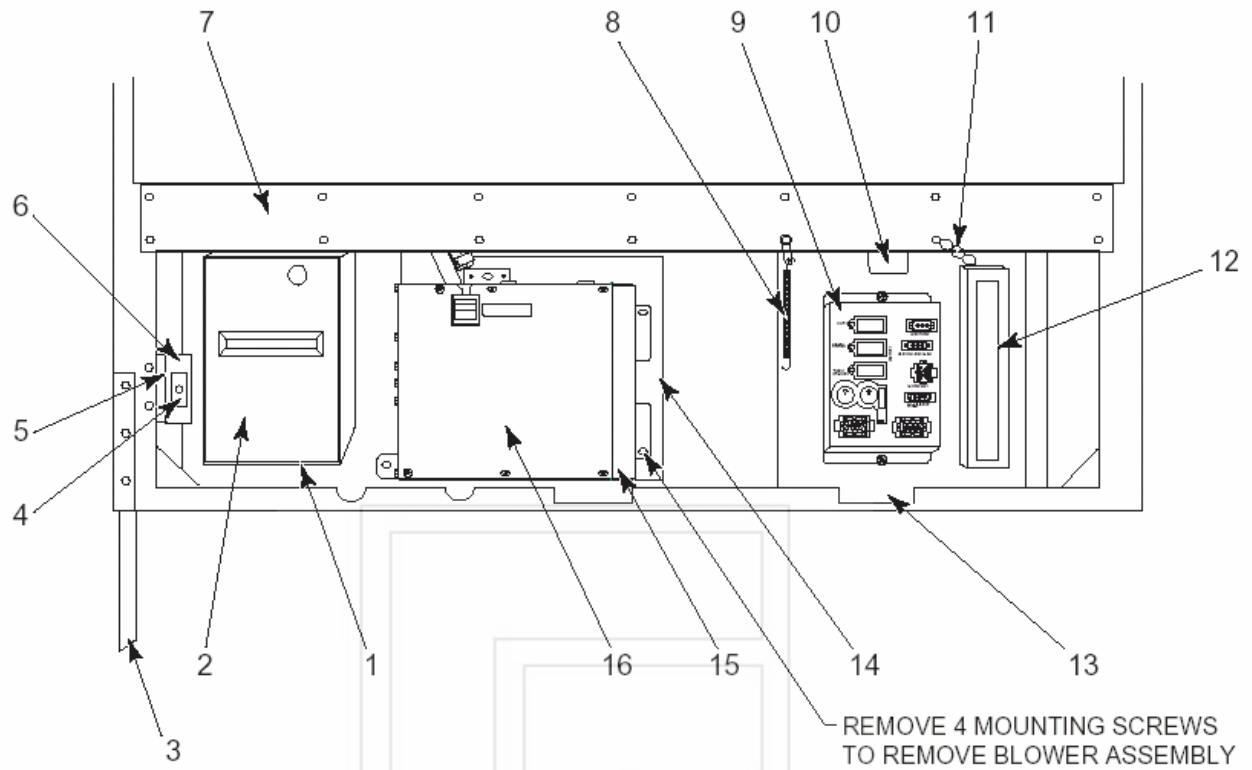
Main Door (Interior)



Main Door (Interior)

Key	Part Number	Description	Qty
	R-74801420	Main Door Final Assembly	Ref.
	R-54801401409	Main Door Weld Assembly	Ref.
1	R-92803502	Main Door Sealing Gasket	1
	R-93400448	Screw	44
2	R-54801840	Fluorescent Lamp Socket Assembly - Top and Bottom	6
	R-74800414	Fluorescent Lamp Bracket	4
3	R-54800438	Door Liner - Top	1
4	R-44800693	Delivery Door Runner (Top and Bottom only)	1
5	R-54800452	Zero Position Switch Housing	1
	R-54800453	Zero Position Switch Retaining Pad (not shown)	1
	R-54801816	Zero Position Switch Assembly (not shown)	1
6	R-74800411	Glass Retainer - Center (Under Lamp)	1
	R-86688043	Insulation - Foamed Tape .13 x 3 x 48.75	1
7	R-54800413	Glass Retainer - Top	1
	R-93400448	Mounting Retaining Screw	3
8	R-91700117	Fluorescent Lamp	3
	R-91700202	Safety Shield	3
9	R-54801800	Heated Glass and Gasket	1
10	R-70703904	Service Switch	1
11	R-90702218	"Service Switch" Label	1
12	R-54800824	Lamp/Harness Panel Cover	1
13	R-54800412	Glass Retainer - Bottom	1
14	R-54801849	Heater Wire (Heater Strip not shown)	1
15	R-54800439	Door Liner - Bottom	1
16	R-44802514239	Door Channel Cover	1
17	R-74800410	C/M Door Mounting Panel	1
18	R-74800412	Light Panel	1
19	R-44800597	Price Cards Holder	1
	R-93400077	Screw	1
	R-28214401	Price and Selection Card Assortment - "01" thru "23" (not shown)	1
20	R-54804005	Anti-Tamper Bracket - LH	1
21	R-28216601	Delivery Door 4"	9
	R-28216604	Delivery Door 5"	2
22	R-44814020	Rail and Cover	10
	R-44800491	Door Runner Molding	10
	R-44800693	Delivery Door Runner	10
	R-44800694	Extension Runner (not shown)	12
	R-44800492	Delivery Door Stop (not shown)	A/R
	R-49000908	Delivery Door Bumper	11
23	R-44800586	Gasket Guard - Main Door	2
24	R-54800519	Anti-Tamper Bracket - Center	1
25	R-28213301	Plate Assembly Locks (Delivery Door) (see Page 6.25)	1

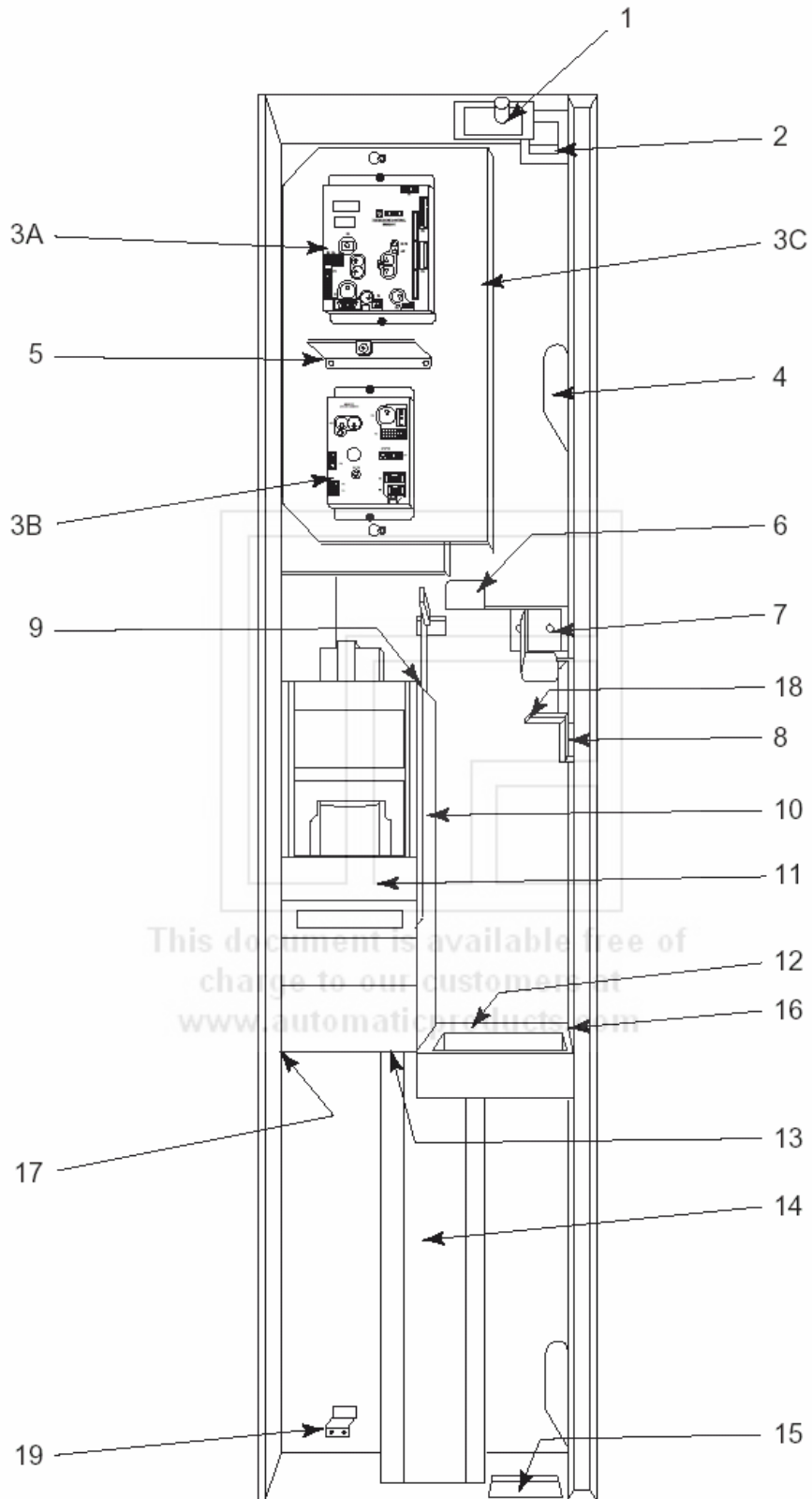
Lower Main Door Components



Lower Main Door Components

Key	Part Number	Description	Qty
1	R-44812403	Cash Box Mounting Bracket W/A	1
2	R-44801916	Cash Box W/A	1
3	R-44800575	Door Leg	1
	R-93400307	Screw	3
4	R-52621286	Door Interlock Switch	1
5	R-44802495	Interlock Switch Mounting Plate	1
6	R-44802496	Interlock Switch Mounting Bracket	1
	R-93400307	Screw	4
7	R-44802514	Door Channel Cover	1
8	R-21200328	Extension Spring	1
	R-97500552	Type 16 Nylon Tie	2
	R-93400307	Screw	2
9	R-28201801	Relay Interface Assembly	1
	R-93400307	Screw	2
10	R-28204401	Line Filter Assembly	1
	R-93400307	Screw	2
11	R-44800935	Door Restraint Chain	1
12	R-28202201	Ballast Assembly - 60 Hz. 120 VAC	1
13	R-44800857	Filler Panel	2
14	R-28204901	Adaptor Bracket (Blower)	1
	R-93400307	Screw	4
15	R-28211701	Blower Filter	1
16	R-28222901	Defrost Blower Assembly	1
17	R-28211101	Blower Assembly Cover	1
	R-93400307	Screw	9
18	R-30785702	Rocker Switch, DPST	1
19	R-28223901	Housing Assembly	1
	R-44804622	Heater Assembly	1
	R-28224001	Heater Bracket	1
20	R-28214702	Thermostat and Terminals	1
	R-00706503	Insulation Tubing - 10.5 in.	2
21	R-90702034	Heater/Blower Switch Label	1
22	R-44802495	Plate	1
23	R-28204301	Blower Harness Assembly	1
24	34802-1	Cable Clamp - 1"	1
25	R-70093401	Cable Clamp - 1/2"	1
26	R-28212301	Blower Mounting Bracket	1
27	R-28211501	Enclosure Box	1
28	R-28211801	Blower Assembly	1
	R-28212501	Blower Motor Only	1
29	R-28224601	Blower Mounting Plate	1
	R-93400307	Screw	13

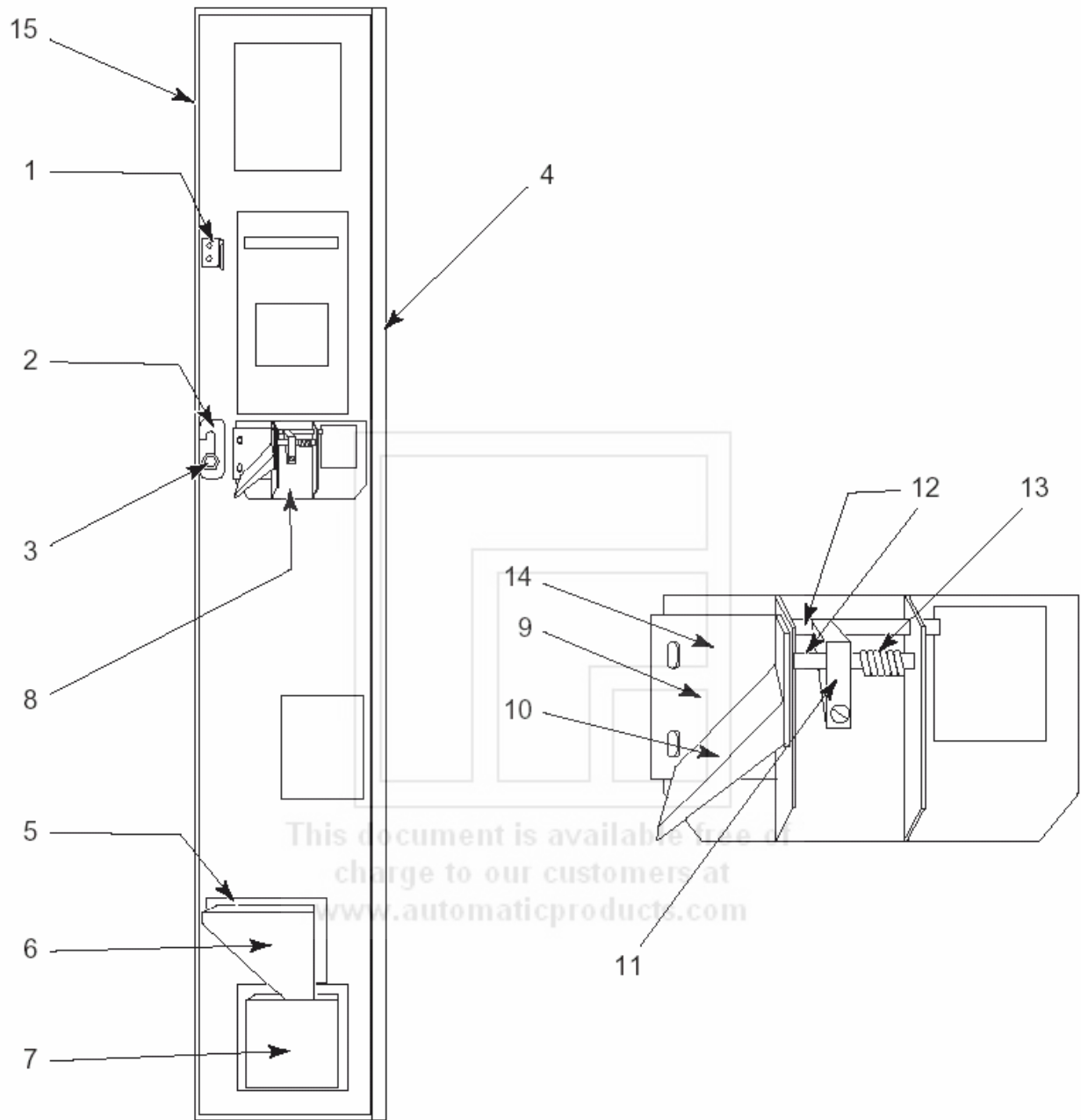
Coin Mech Compartment



Coin Mech Compartment

Key	Part Number	Description	Qty
1	R-44801591	Coin Mech Door - Interlock Switch	1
	R-54800810	Switch Mounting Bracket	1
2	R-44800487	Locking Bracket - Top	1
	R-93400307	Screw	2
3A	R-28202001	Machine Control Board Assembly (see Page 6.31)	1
3B	R-28202102	Credit Module Assembly (see Page 6.33)	1
3C	R-28216101	Controller Mounting Plate	1
4	R-44801417	Main Door Latch Assembly	2
	R-93400307	Screw	8
5	R-28216001	Message Center Stop Assembly	1
6	R-44812416	Lever and Actuator Assembly to Coin Return	1
	R-44802457	Actuator Assembly Lever to Coin Mech Door	1
	R-44802459	Lever Mounting Bracket	1
	R-44802458	Coin Mech Roller Actuator Lever	1
	R-13300481	Lever Return Spring	1
	R-44802480	Lever Pivot Step Washer	1
	R-934-00307	Lever Pivot Screw	1
7	R-44802563	Coin Mech Position Bracket	1
8	R-44800418	Locking Hook	1
9	R-44802560	Nest Stop Link	2
	R-44802562	Link Pivot	2
10	R-44812468	Coin Mech and BA Mounting Nest w/spring	1
	R-44812473	Rivet and Weld Assembly Nest	1
	R-13200069	Latch Spring Only, (not shown)	1
12	R-44812402	Coin Chute W/A (to Coin Return Cup)	1
13	R-44802559	Coin Mech Nest Pivot Shaft	1
14	R-44812470	Coin Chute W/A (to Cash Box)	1
15	R-44800485	Locking Bracket – Bottom	1
16	R-22109601	Coin Mech Keeper	1
17	R-44802469	Pivot CBA Bracket	1
18	R-28220401	Coin Mech Socket Mounting Plate Assembly (micromech)	1
	R-54800435	Coin Mech Socket Mounting Bracket	1
	R-28203201	Harness - Board to Coin Mech Socket (micromech)	1
	R-90900022	Drive Pin, .073 x 1"	1
	R-97500549	Nylon Tie Type 16	1
	R-92400177	Nut	1
	R-54800499	Coin Mech Plug Retainer (Large)	1
	R-44802477	Coin Mech Plug Retainer (Small)	1
	R-40800431	Torque Knob (not shown)	1
19	R-44802564	Remote Electronics Clip	1

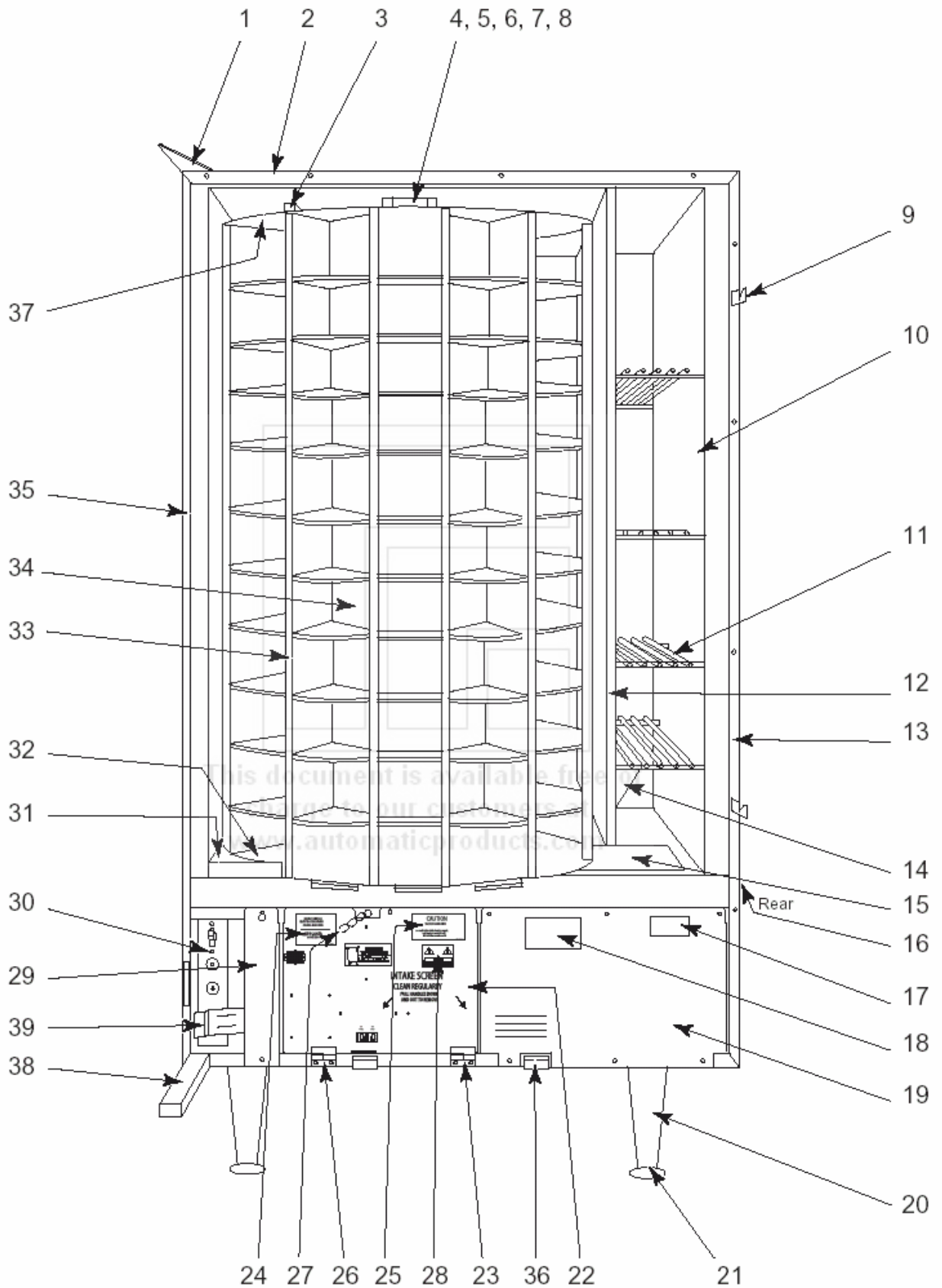
Door Assembly Coin Mech Compartment



Door Assembly Coin Mech Compartment

Key	Part Number	Description	Qty
	76600000	Coin Mech Compartment Door Assembly	Ref.
1	R-54800433	Message Center Latch Spring	1
	438-8	Nut	2
2	R-44800733	Coin Mech Door Lock Bar Bracket	1
	R-93400151	Screw	2
	R-44802417	Coin Mech Door Lock Bar	1
	R-70134133	Retaining Ring	2
3	76400001	Lock Bar Actuator Cam	1
	R-44800734	"T" Handle Nut Spacer	1
	R-92400181	"T" Handle Nut	1
4	R-28219501	Coin Mech Compartment Door Hinge	1
5	R-44802426	Coin Return Chute	1
6	R-44801417	Coin Return Back Chute	1
7	202810	Coin Return Cup	1
	12000348	Security plate to Convert Standard Coin Cup to Security Coin Cup	Alt.
	16600280	Security Coin Cup	Alt.
	420144	Ferrule	1
	305-8R6	Screw #8 X 3/8.	1
8	R-54801422	Coin Insert Assembly	1
9	R-54801414	Coin Insert Bracket W/A	1
	R-89293007	Bracket Mounting Screw	4
10	R-44802424	Coin Chute	1
	R-44802425	Coin Chute Backing Plate (Gate)	1
	R-93400151	Screw	5
11	R-44812408	Coin Return Lever and Nut	1
	R-92100026	Coin Return Lever Screw	1
	R-92400006	Coin Return Lever Nut	1
12	R-49000435	Coin Return Pivot Shaft	2
	R-93300005	Retaining Ring	3
13	R-49000498	Lever Return Spring	1
14	R-49000584	Coin Insert Gate	1
15	76400000	Coin Mech Compartment Door - Rivet Assembly	1

Cabinet Final Assembly



Cabinet Final Assembly

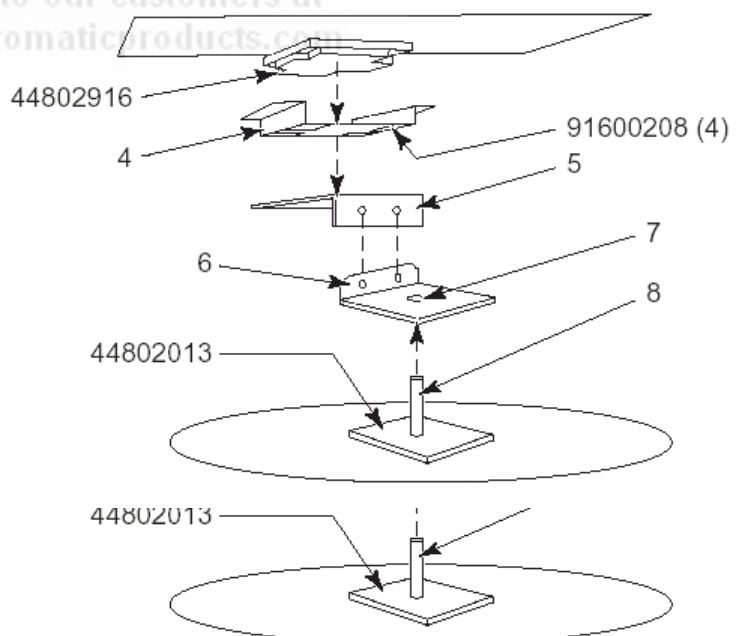
Key	Part Number	Description	Qty
	R-54801305	Cabinet Weld Assembly	1
1	R-44801309	Top Pivot Plate	1
	R-93400291	Bolt (not shown)	2
	118-51-10	Carriage Bolt (not shown)	1
	438-51	Nut (Carriage Bolt) (not shown)	1
	620-51	Lock washer	2
2	R-54800461	Liner Retainer - Top	1
3	R-44812883	Magnet and Bracket Assembly	1
	R-92900061	Rivet	2
4	R-44802009	Bearing Bracket Hat (see Page 6.16)	1
	R-91600208	Insulator Grommet, Type 12	4
	R-44802916	Insulation - Pivot Mounting Bracket	1
5	R-54800345	Mounting Bracket	1
6	R-54800346	Securing Bracket	1
	R-80715708	Machine Screw, 1/4 - 20 x 1/2, Hex Head	2
7	R-92600022	Nylon Bearing	1
8	R-54801425	Pivot Pin R/A (see Page 6.16)	1
8A	R-92100343	Machine Screw, 10 - 32 x 3/8, Truss Head	4
9	R-44802349	Main Door Latching Hook	2
	R-93400199	Hook Mounting Screw	6
10	R-44802333001	Cabinet Liner (Black)	1
11	R-44812901	Storage Shelf	4
12	R-54801901239	Shelf and Reinforcement Divider W/A (Black)	1
13	R-54800460	Liner Retainer - RH	1
14	R-44844004	Shelf Mounting Bracket	2
15	R-44812308	Turret Tray Screen	1
16	R-44812306239	Rear Exhaust Screen (back of Cabinet)	1
17	77400007	Data Plate - 748 - 115 V, 60 Hz	1
18	R-90700928	Warning Label - "Tighten Screws"	1
19	R-54800311239	Refrigeration Unit Cover - RH	1
	R-74801200	Refrigeration Unit Assembly - 120 V Domestic (see Page 6.27)	Ref.
	R-74821500	Refrigeration Unit Assembly - 220 V Export (see Page 6.29)	Ref.
20	R-40801316309	Assembly Leg (includes Leveler)	4
	R-80715712	Bolt, 1/4 - 20 x 3/4, SEMS Hex Head	12
21	R-40800352	Leveler Only	4
22	R-74801800	Power Supply Final Assembly (see Page 6.17)	1
	R-54801524239	Power Supply Cover	1
23	R-54801321239	Hinge and Pin Assembly – RH	1
	R-93400199	Screw	2
24	R-90702217	Label - "Service Switch Instructions"	1
25	R-90702193	Label - "Caution Power Supply"	1
26	R-54801322239	Hinge and Pin Assembly – LH	1
	R-93400199	Screw	2

Cabinet Final Assembly (Continued from Page 6-19)

Key	Part Number	Description	Qty
27	R-44800935	Door Stop Chain	1
	R-93400484	Screw	1
28	R-90701094	Label - "High Voltage"	1
29	R-54800342239	Refrigeration Unit Cover – LH	1
	R-54801424	Line Filter Assembly (export only)	1
	R-93805000	Line Filter (export only)	1
	R-25166910	Terminal Block (export only)	1
	R-54800524	Filter Bracket (export only)	1
	R-54801000	Harness Assembly (export only)	1
30	R-44812845	Main Switch Power Assembly (see Page 6.19)	1
31	R-44800056239	Turret Drive Cover (Black)	1
32	R-44812601	Main Plate Assembly (Black)	1
33	R-44800606239	Shelf Retainer (Black)	7
	R-44802269005	Column Separator (Smoked)	7
	R-93400486	Screw	14
	R-94100078	Speed Nut	7
34	R-54801601B	Center Column Rivet Assembly - 11 Shelf (Black)	1
35	R-54800459	Liner Retainer – LH	1
36	R-54801308	Condenser Screen W/A	1
	R-94100092	Condenser Screen Clip (not shown)	2
37	R-44802007239	Upper Turret Plate (Black)	1
38	R-44801306309	Pivot Assembly Bracket	1
39	R-54800525	Interlock Switch Spring Actuator	1
NS	R-44802328	Bottom Tray, Inner Cabinet	1

Product Shelves

- 44802601 Split 4"
- 44802602 Split 5"
- 44800600 Platter 4 and 5"
- 44801607 Over/Under

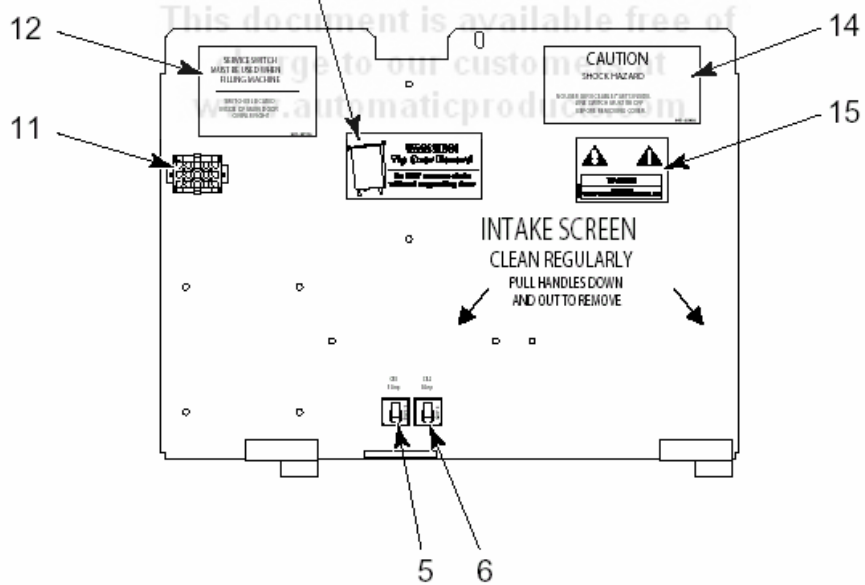
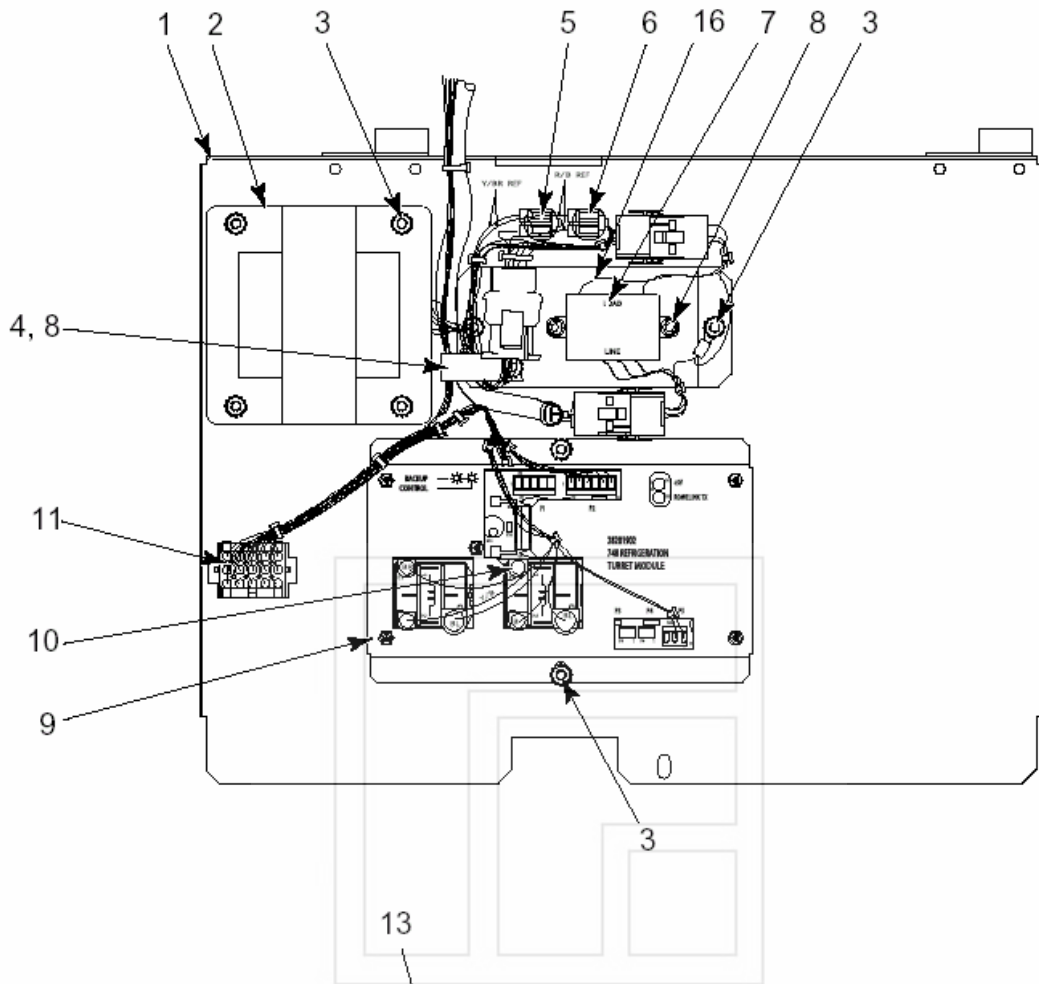


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Power Supply Assembly

Power Supply Open (Dropped Down)



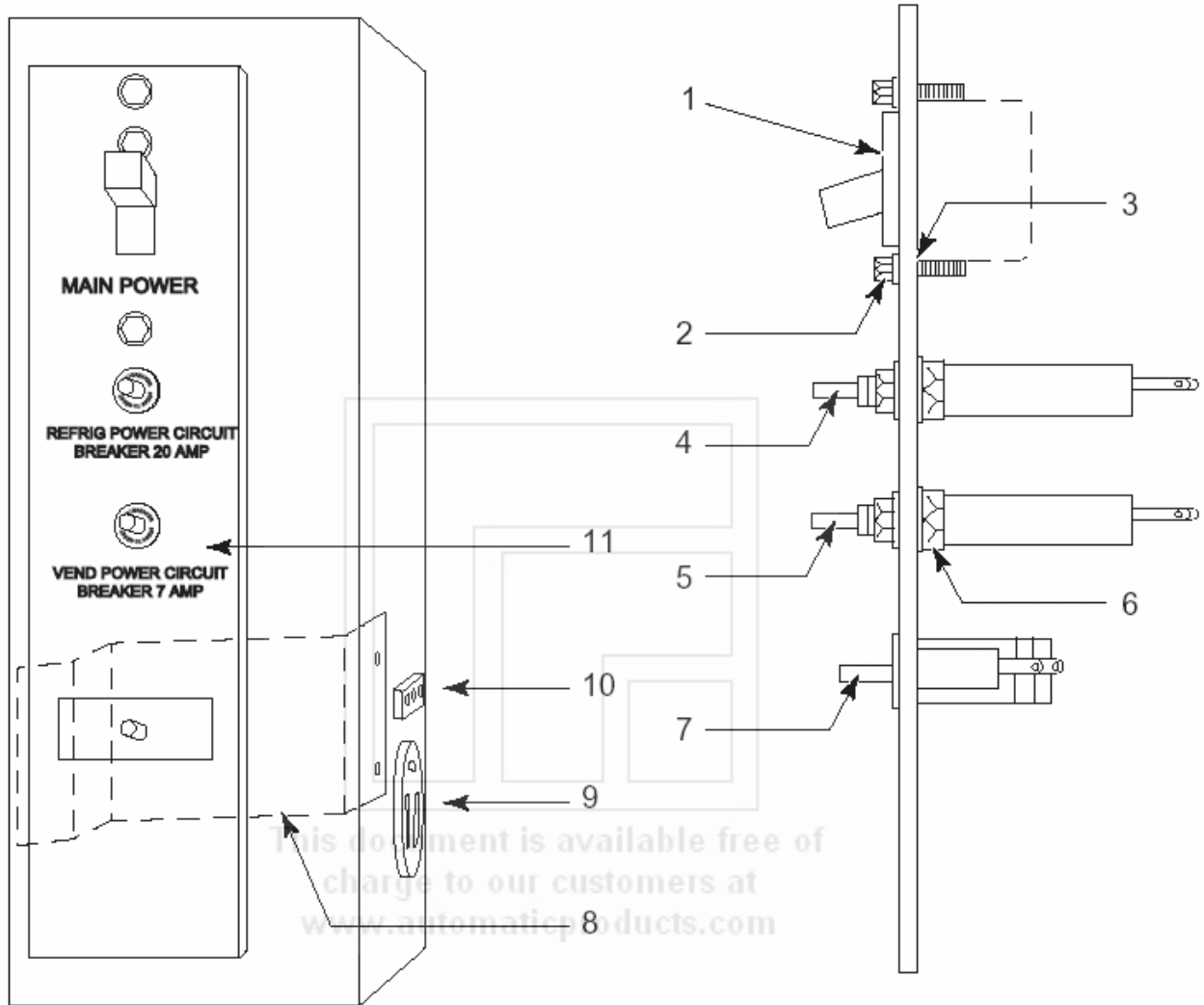
Outside of the Refrigeration Cover (Power Supply Closed)

Power Supply Assembly

Key	Part Number	Description	Qty
	R-74801800B	Power Supply Assembly	Ref.
1	R-54801524239	Rivet and Weld Assembly Cover	1
2	R-28201601	Power Transformer	1
3	438-8	Nut, #8 - 32 KEPS	8
4	34802-1	Cable Clamp, 1"	1
5	R-70073608	Circuit Breaker, 5 Amp	1
6	R-70073606	Circuit Breaker, 3 Amp	1
7	R-28204401	Line Filter Assembly	1
8	R-93400307	Screw, #8-32 x 3/8 HWH SEMS	3
9	R-28201902	Refrigeration/Turret Controller Assembly	1
10	R-70096705	Insulated Faston, .250	1
11	R-28206302	Harness Assembly - 748 Cabinet	1
12	R-90702217	Label - "Service Switch, Instructions"	1
13	R-90704034	Label - "Support Door"	1
14	R-90702193	Label - "Caution, Power Supply"	1
15	R-90701094	Label - "High Voltage"	1
16	R-28220101	Mounting Plate (Line Filter)	1

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Main Power Switch

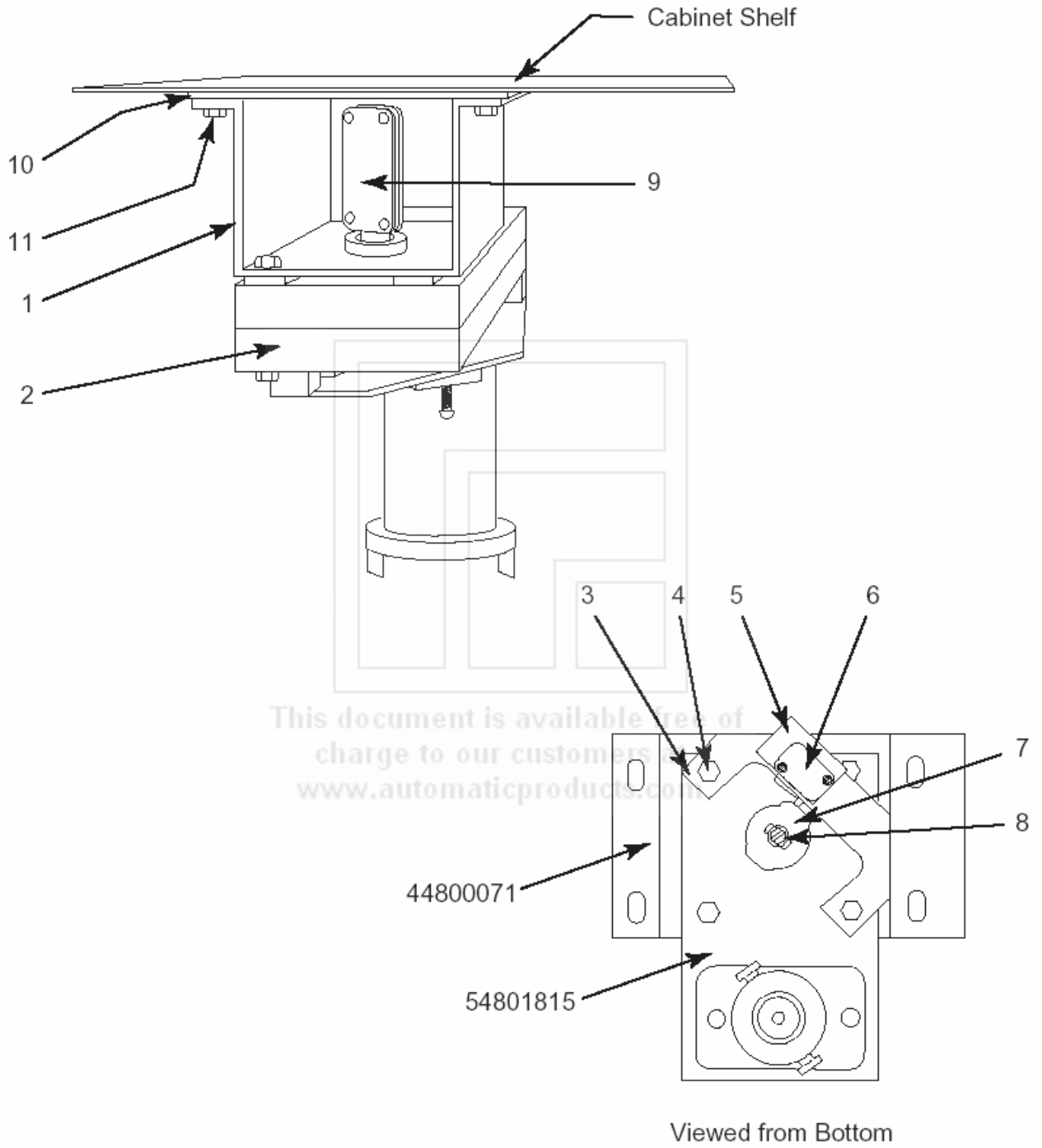


Main Power Switch

Key	Part Number	Description	Qty
	R-44812845	Main Switch Assembly - Complete	1
	R-54821528	Switch Panel Assembly - Export (not shown)	1
1	R-30101711	Main Line Switch	1
2	R-93400307	Screw	2
3	R-95000349	Lock washer	2
4	R-91200049	Refrigeration Unit Circuit Breaker - 20 Amps	1
	R-91200046	Refrigeration Unit Circuit Breaker - 10 Amps (Export)	1
5	R-91200050	Vend Power Circuit Breaker - 7 Amps	1
	R-91200056	Vend Power Circuit Breaker - 5 Amps (Export)	1
6	R-95000110	Washer	2
7	R-44812848	Refrigeration Compressor Switch	1
8	R-54800525	Refrigeration Compressor Switch Actuator Spring (not part of this Assembly)	Ref.
9	R-97901275	Refrigeration Power Cord Receptacle	1
	R-97901276	Refrigeration Power Cord Receptacle (Export)	1
10	R-30749002	Vend Circuit Harness Plug Socket	1
11	R-44802815239	Switch Panel w/ Silkscreen	1
	R-54821535239	Switch Panel w/ Silkscreen (Export)	1
12	R-55001875	Harness, Wire set Power Assembly (not shown)	1

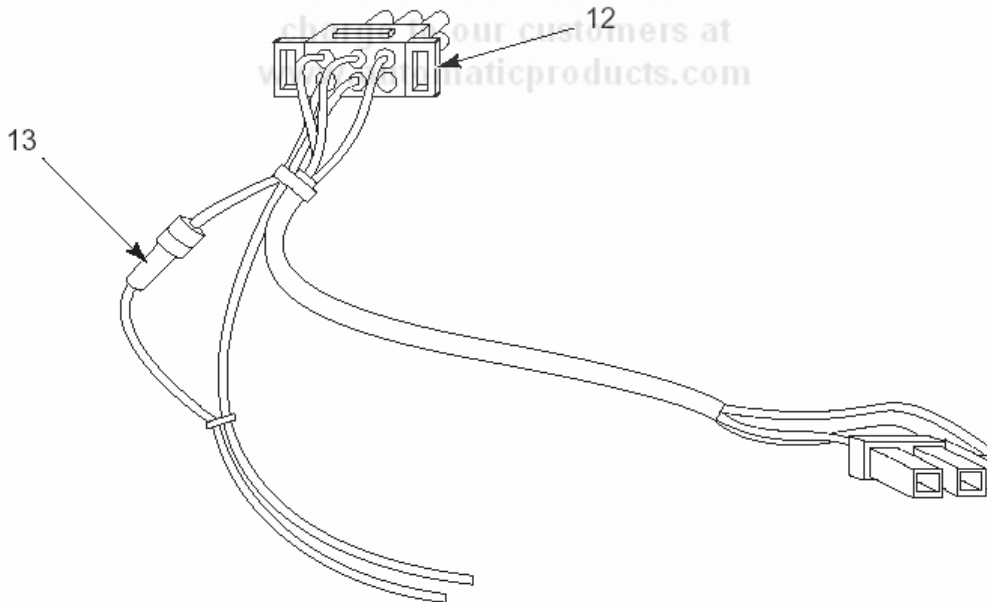
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Turret Drive Motor



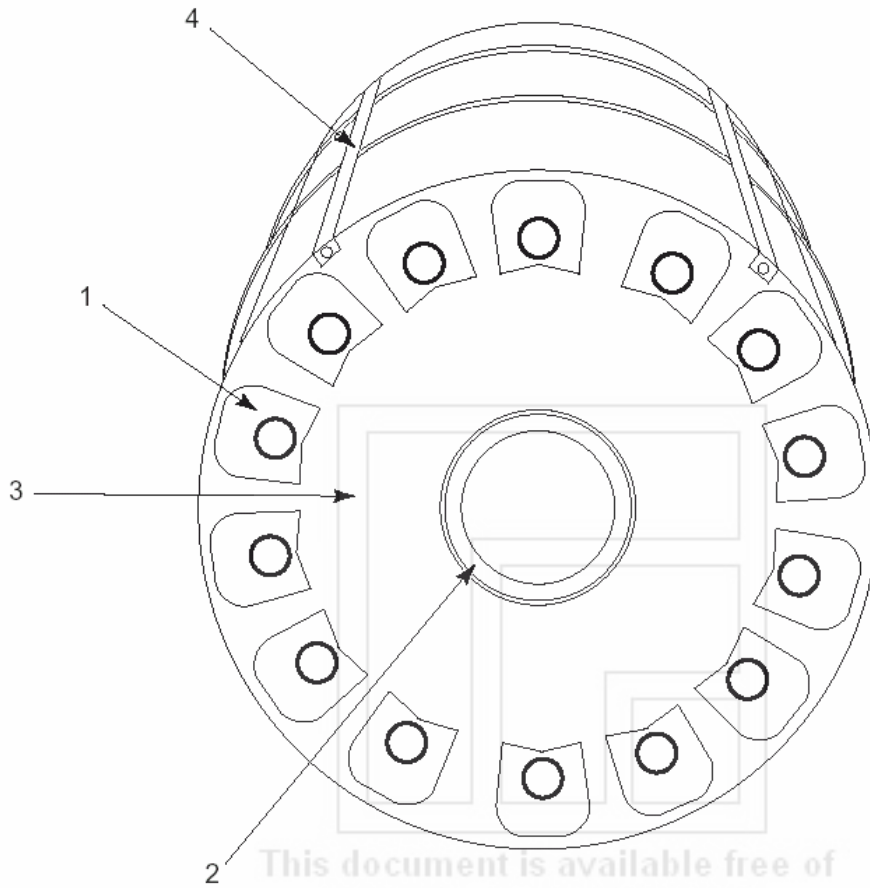
Turret Drive Motor

Key	Part Number	Description	Qty
	R-54801814B	Drive Motor - Switch and Plate Assembly	
1	R-44800071	Drive Motor Mounting Plate	1
2	R-54801815	Drive Motor and Gear Box - Transport	1
3	R-54800011	Switch Mounting Plate	1
4	R-92100211	Machine Screw, #10 - 32 x 1	4
	R-87844400	Nut, #10-32	4
5	R-93900954	Fishpaper Insulator	1
6	R-42104503	Transport Motor Switch - Half Cycle	1
	R-93400210	Screw, #4 - 40 x 5/8, Type 23	2
7	R-44800087	Switch Actuator Cam	1
8	R-92100309	Machine Screw, #8 - 32 x 1	1
	R-95000052	Washer, #8 Flat	1
	438-8	Nut, #8 - 32, KEPS	1
9	R-44806022	Coupling Kit	1
	R-54801314	Coupling Assembly - Back	1
	R-44800086	Coupling	1
	R-94700020	Socket Screw, #10 - 32 x 7/8	4
	R-95000010	Washer, #10 Lock	4
	R-44800096	Height Adjustment Pin (not shown)	1
10	R-44800041	Bearing Plate	1
11	R-93400199	Screw - S/T, #10 x 3/8, Type Z	4
12	R-54801838	Turret Motor and Half Cycle Switch Harness	1
13	R-91300031	Fuse Holder	1
	R-91200015	Fuse - 3.2 Amp - SLO-BLO (Type MDL 3.2)	1



Fuse Holder

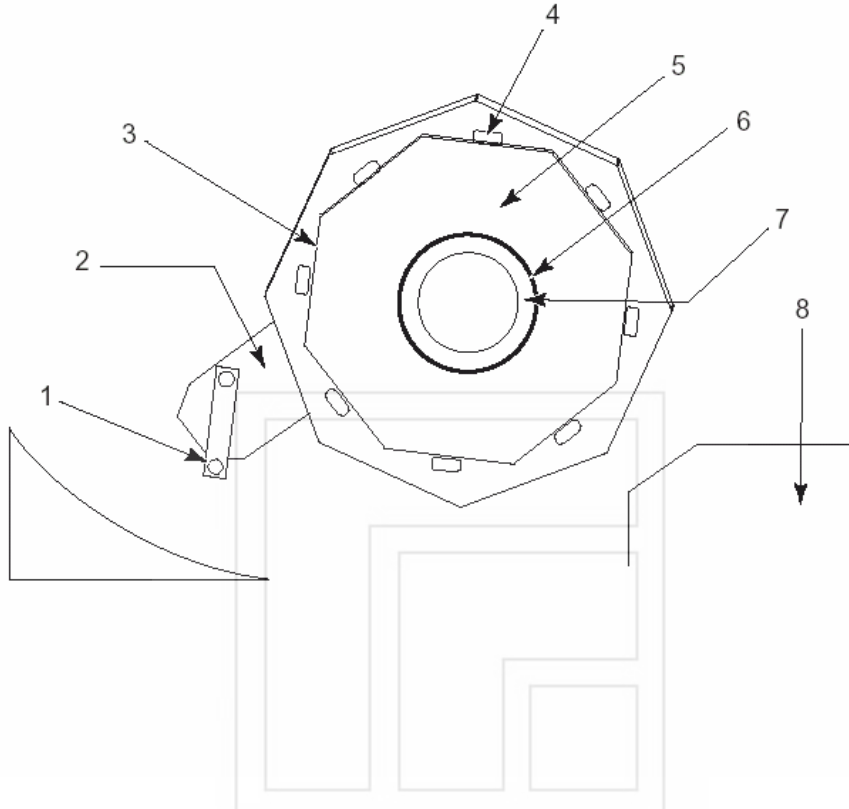
Turret Components (Bottom)



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Key	Part Number	Description	Qty
	R-44812601	Main Plate Assembly	
1	R-44800095	Turret Drive Cam (Molded)	14
	R-93400492	Screw - S/T, #8 x 5/8, Type Z, Truss Head	56
2	R-44802002	Turret Ring (Air Sealed)	1
	R-93400154	Screw - S/T, #8 x 3/8, Type Z	5
3	R-44802600239	Main Turret Plate (Black)	1
4	R-44800606239	Shelf Retainer (Black)	7

Turret Drive & Roller



Key	Part Number	Description	Qty
1	R-44801028B	Drive Shaft and Bearing Assembly	1
	R-44800061	Cam Follower	2
	R-44801029	Drive Arm	1
	R-92400064	Nut	2
	R-95000090	Flat Washer	2
2	R-44801033	Housing and Plate and Bearing Assembly	1
	R-93400452	Screw - Self Tapping	3
3	R-44812105	Lower Plate Weld Assembly	1
	R-93400452	Screw - Self Tapping	7
4	R-44800081	Roller	8
	R-44800090	Shoulder Bolt	8
5	R-44812107	Roller Guide Plate Weld Assembly	1
6	R-91600091	Grommet	1
7	R-44802001	Ring Turret - Lower	1
8	R-44812308	Screen Weld Assembly, turret Tray	1

Plate Assembly – Locks (Delivery Door)

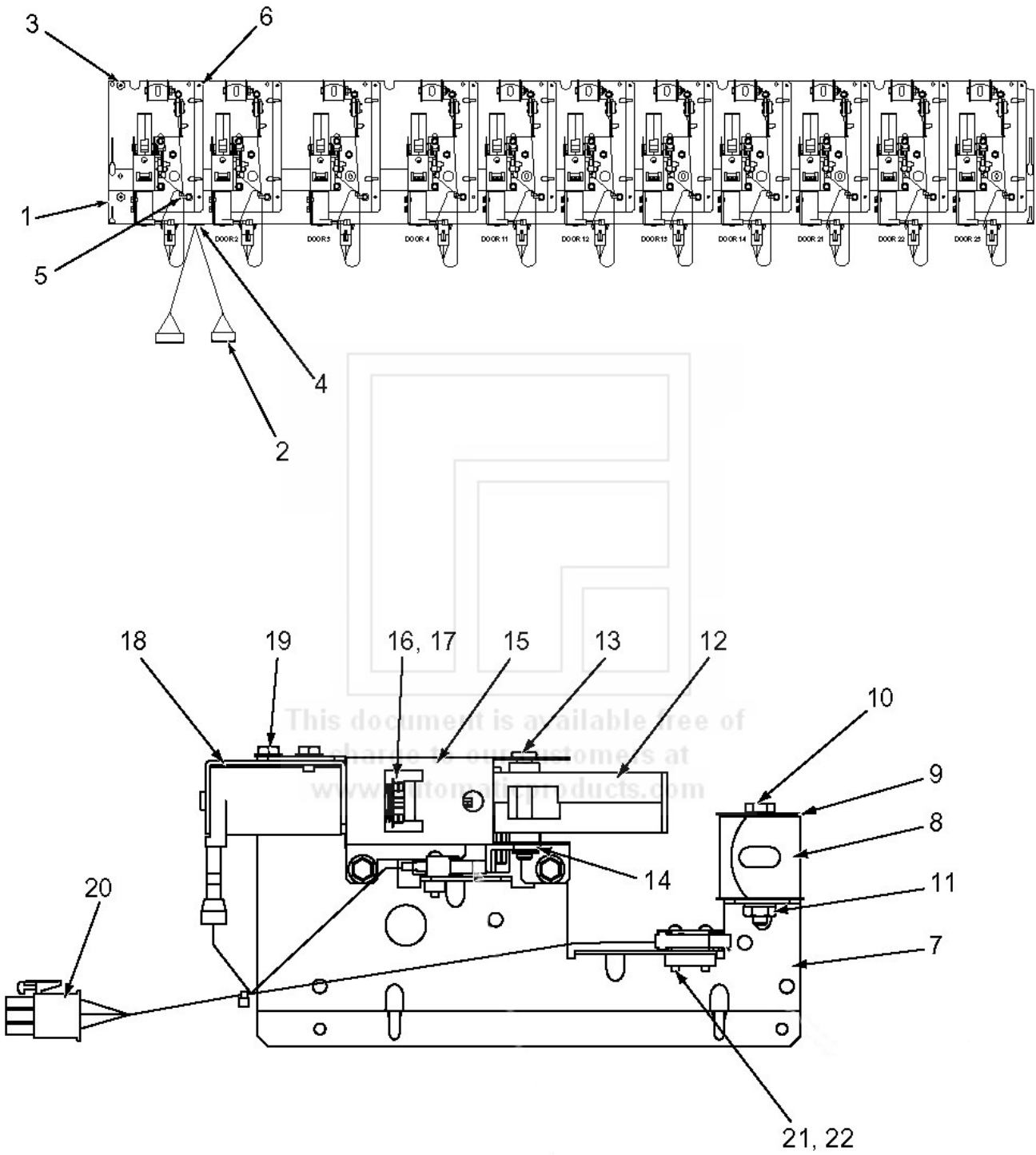


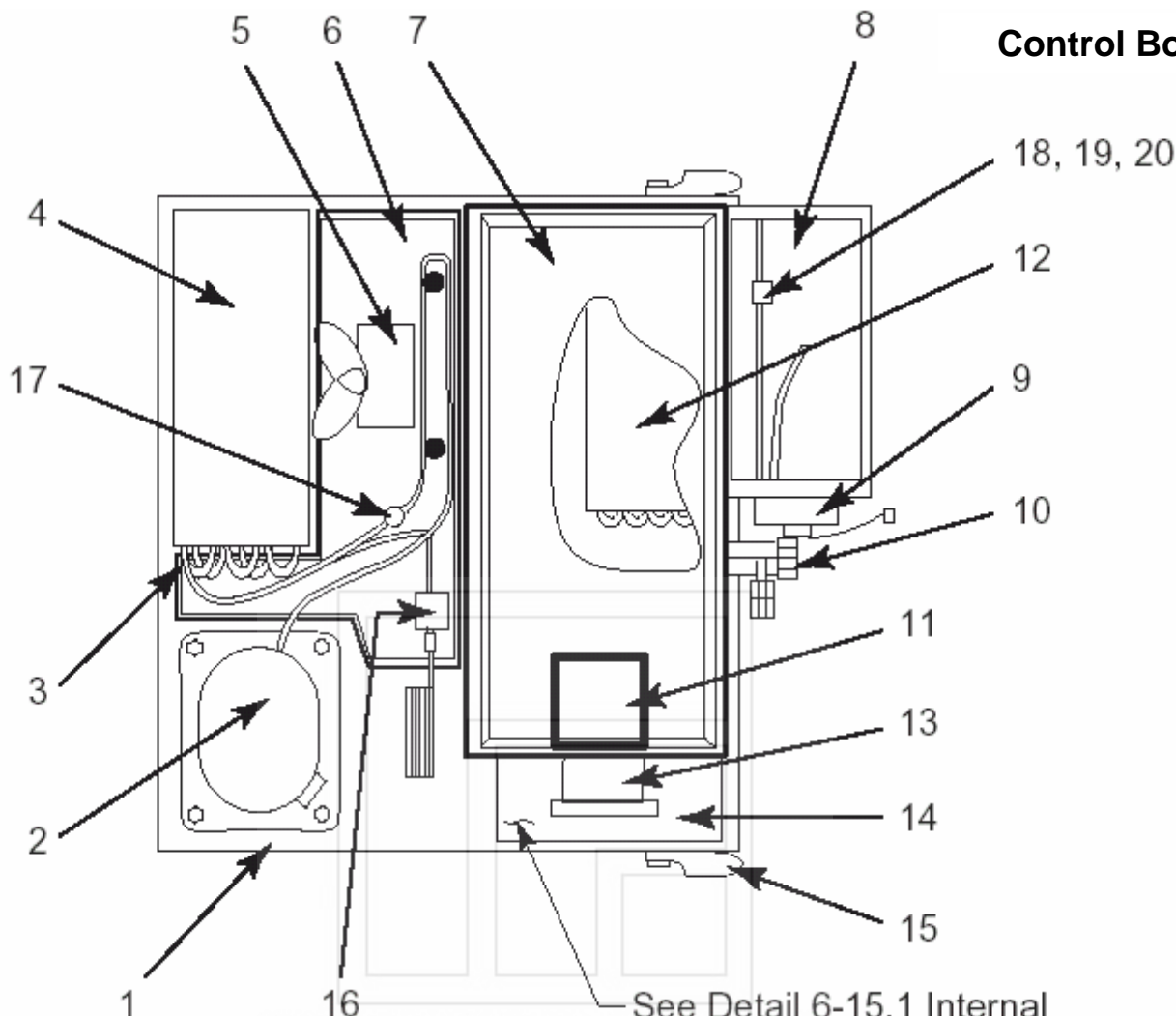
Plate Assembly – Locks (Delivery Door)

Key	Part Number	Description	Qty
	R-28213301B	Plate Assembly - Locks	Ref.
1	R-74800412	Door Mechanism Panel	1
2	R-28223301	Harness Assembly - Control to Lock Assembly	1
3	R-70121910	Spacer - Hex	2
4	R-70233204	Split Bushing	1
5	R-25079802	Lug	11
	R-93400151	Screw - #8 - 32 x 1/4, Self-tapping	55
6&7	R-28219101	Lock Assembly Complete includes Items 6-22	11
7	R-28219202	Rail/Switch Mounting Bracket	11
8	R-44801403003B	Spool & Spring Assembly	11
9	R-95000338	Washer - Flat	22
10	R-28222601	Spring Pin	11
11	R-21357811	#8 - 32 Elastic Stop	11
12-15	R-28224201	Latch Assembly includes items 12-15	11
12	R-28224051	Latch Linkage	11
13	R-28218001	Clevis Pin Assembly	11
14	R-28224701	Switch Actuator	11
15	R-28224401	Lock Mechanism	11
16	R-91100035	Eyelet	11
17	R-28217001	Compression Spring	11
18	R-28218201	Solenoid Assembly - Sealed, Coil Only	11
19	R-92100170	Screw - #6 - 32 x 3/16 Machine	22
20	R-28218401	Switch (both) & Harness Assembly	11
21	R-80500508	Screw - #2 - 56 x 1/2 PRH SEMS	44
22	R-00030762	Nut - Twin	22

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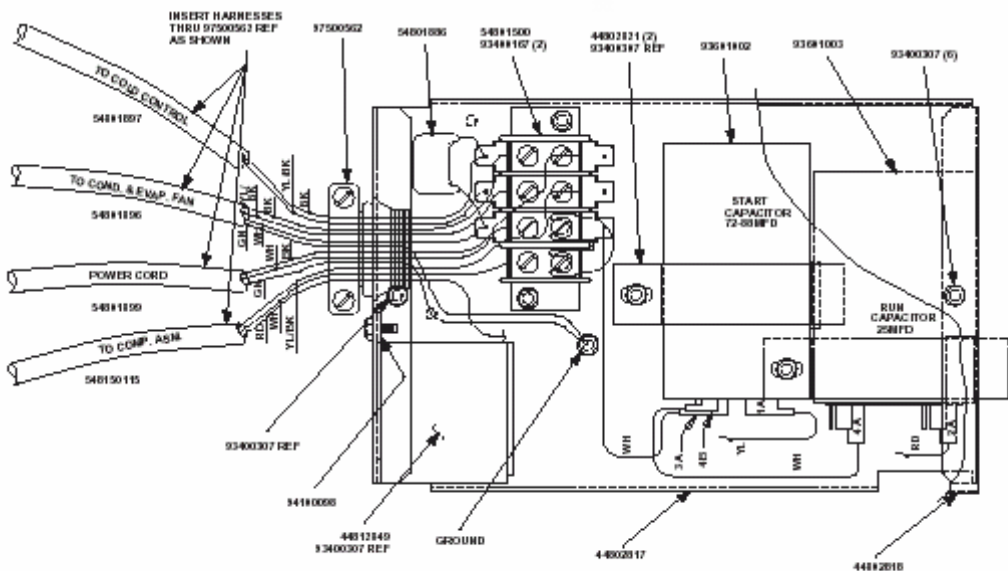
Refrigeration Unit – 120 V Domestic

Control Box Assem



See Detail 6-15.1 Internal View of Control Box Assembly

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Refrigeration Unit – 120 V

Key	Part Number	Description	Qty
	R-74801200B	Refrigeration Unit Assembly - Complete, R404a, 120 V, 60 Hz	Ref.
1	R-44812209239	Refrigeration Unit Base and Stud Assembly	1
2	R-54801214	Compressor - R404a, 120 V, 60 Hz	1
3	R-54821564	Condenser Coil Assembly	1
4	R-44802225239	Condenser Unit Assembly Shroud	1
5	R-44802246	Drip Tray	1
6	R-54821565	Condenser Fan Assembly	1
	R-54821567	Condenser Fan Blade	1
	R-44801228	Condenser Fan Motor	1
	R-44802215	Condenser Fan Mounting Bracket	1
	738-41	Nut, 1/4 - 20, Fan Assembly Mounting	1
7	R-44802247239	Evaporator Cover	1
8	R-44812212B	Air Return Housing Assembly	1
	R-44802243	Gasket only, Air Return Housing	1
9	R-54801204B	Thermostat and Cover Assembly	1
	R-44801829	Thermostat	1
	R-70219479	Tubing Insulation	1
	R-54801513	Harness Assembly	1
	R-59520501239	Temperature Control Cover	1
10	R-44812211	Service Valve Assembly - Complete, High Side & Low Side	2
	R-44812219	Valve Core only (Schrader)	2
	R-44812220	Service Valve Cap and Seal	2
11	R-44802242	Evaporator Output Gasket	1
12	R-54821578B	Evaporator and Bracket Rivet Assembly	1
13	R-44812222B	Evaporator Blower and Bracket Assembly	1
	R-54801855	Blower Motor only	1
	R-59521544	Squirrel Cage only	1
	R-44802248239	Bracket Blower	1
	R-91600207	Insulator Grommet	3
	R-44802264	Motor Gasket	1
	R-44802244	Evaporator Blower Gasket	1
14	R-54801895B	Control Box Assembly	1
	R-44812849	Start Relay	1
	R-93601002	Start Capacitor, 72-88 MFD	1
	R-93601003	Run Capacitor, 25 MFD	1
	R-44802821	Capacitor Clamp	2
	R-44802817	Control Panel Base	1
	R-44802818	Control Box Cover	1
	R-54801896	Evaporator Fan and Condenser Fan Harness	1
	R-54801899	Compressor Power Cord	1
	R-54801897	Compressor Cold Control Harness	1
	R-54801501	Compressor Harness	1
	R-54801886	Snubber ASM (in Control Box)	2
15	R-44802241	Refrigeration Unit Securing Lever	2
	R-44802249	Lever Pivot Bushing	2
	R-95000030	Washer	2
	R-92100193	Screw	2
16	R-59521513	Drier Type 032S	1
17	R-70725101	Pressure Switch	1
18	R-28204701	Temperature Sensor Circuit Board Assembly	1
19	R-70500006	Circuit Board Support	3
20	R-28203701	Temperature Probe Harness	1

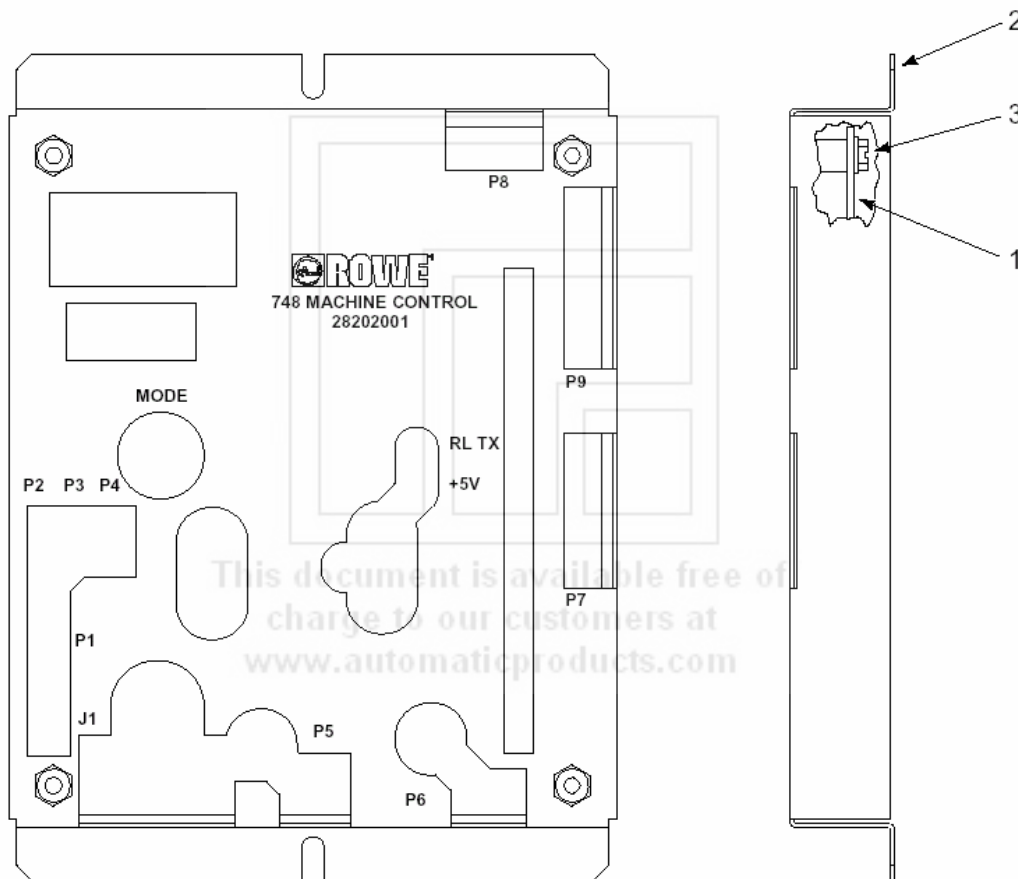
Refrigeration Unit – 220 V Export

Key	Part Number	Description	Qty
	R-74801500B	Refrigeration Unit Assembly - Complete, R404a, 220/240 V, 50/60 Hz	Ref.
1	R-44812209239	Refrigeration Unit Base and Stud Assembly	1
2	R-54821558	Compressor - R404a	1
3	R-54821564	Condenser Coil Assembly	1
4	R-44802225239	Condenser Unit Assembly Shroud	1
5	R-44802246	Drip Tray	1
6	R-54821562	Condenser Fan Assembly	1
	R-54821567	Condenser Fan Blade	1
	R-54821525	Condenser Fan Motor	1
	R-44802215	Condenser Fan Mounting Bracket	1
	738-41	Nut, 1/4 - 20, Fan Assembly Mounting	1
7	R-44802247239	Evaporator Cover	1
8	R-44812212B	Air Return Housing Assembly	1
	R-44802243	Gasket only, Air Return Housing	1
9	R-54801204	Thermostat and Cover Assembly	1
	R-44801829	Thermostat	1
	R-70219479	Tubing Insulation	1
	R-54801513	Harness Assembly	1
	R-59520501239	Temperature Control Cover	1
10	R-44812211	Service Valve Assembly - Complete, High Side & Low Side	2
	R-44812219	Valve Core only (Schrader)	2
	R-44812220	Service Valve Cap and Seal	2
11	R-44802242	Evaporator Output Gasket	1
12	R-54821578	Evaporator and Bracket Rivet Assembly	1
13	R-44812222	Evaporator Blower and Bracket Assembly	1
	R-54801855	Blower Motor only	1
	R-59521544	Squirrel Cage only	1
	R-44802248239	Bracket Blower	1
	R-91600207	Insulator Grommet	3
	R-44802264	Motor Gasket	1
	R-44802244	Evaporator Blower Gasket	1
14	R-54821537	Control Box Assembly	1
	R-54821526	Start Relay	1
	R-93601006	Start Capacitor, 72-88 MFD	1
	R-93601007	Run Capacitor, 25 MFD	1
	R-44802821	Capacitor Clamp	2
	R-44802817	Control Panel Base	1
	R-44802818	Control Box Cover	1
	R-54821540	Evaporator Fan and Condenser Fan Harness	1
	R-54821548	Compressor Power Cord	1
	R-44812867	Compressor Cold Control Harness	1
	R-54821556	Compressor Harness	1
	R-54804506	Snubber Harness	1
	R-59801886	Snubber ASM (in Control Box)	2
15	R-44802241	Refrigeration Unit Securing Lever	2
	R-44802249	Lever Pivot Bushing	2
	R-95000030	Washer	2
	R-92100193	Screw	2
16	R-59521513	Drier Type 032S	1
17	R-70725101	Pressure Switch	1
18	R-28204701	Temperature Sensor Circuit Board Assembly	1
19	R-70500006	Circuit Board Support	3
20	R-28203701	Temperature Probe Harness	1

748 Control Assembly

Harnesses

Connector	Part Number	Description
P1	R-28203001	Harness to Price Display Boards
P2	R-28202701	Serial link Harness to Credit Module
P3	R-74801801	Serial link Harness to Optional Talker Module
P4,P5,P6	R-28202501	Harness to Relay Interface Board & Credit Module
P7,P9	R-28223301	Harness to Doors & Solenoids
P8	R-44801591	Harness to Coin & Main Door
J1	R-59301843	RS232 Interface Printer Harness

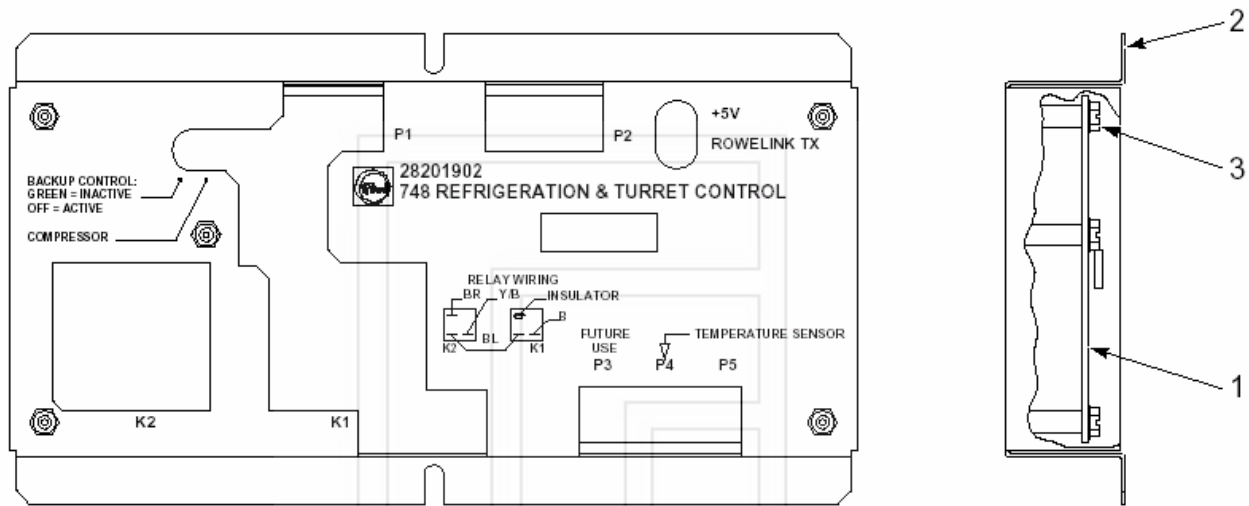


Key	Part Number	Description	Qty
	R-28202001	Machine Controller Assembly	
1	R-28099904	Board - 748 Machine Controller	1
2	R-28205002	Cover - 748 Machine Control	1
3	R-80443006	Screw, #8 - 32 x 3/8	4
NS	R-70042720	Eprom – specify revision	1

Refrigeration/Turret Control Module

Harnesses

Connector	Part Number	Description
P1	R-28206302	Harness to Turret Motor & ½ Cycle Switch
P2, P5	R-28206302	Harness Power In & Serial Link
P3		Future Use
P4		Harness to Temp Probe



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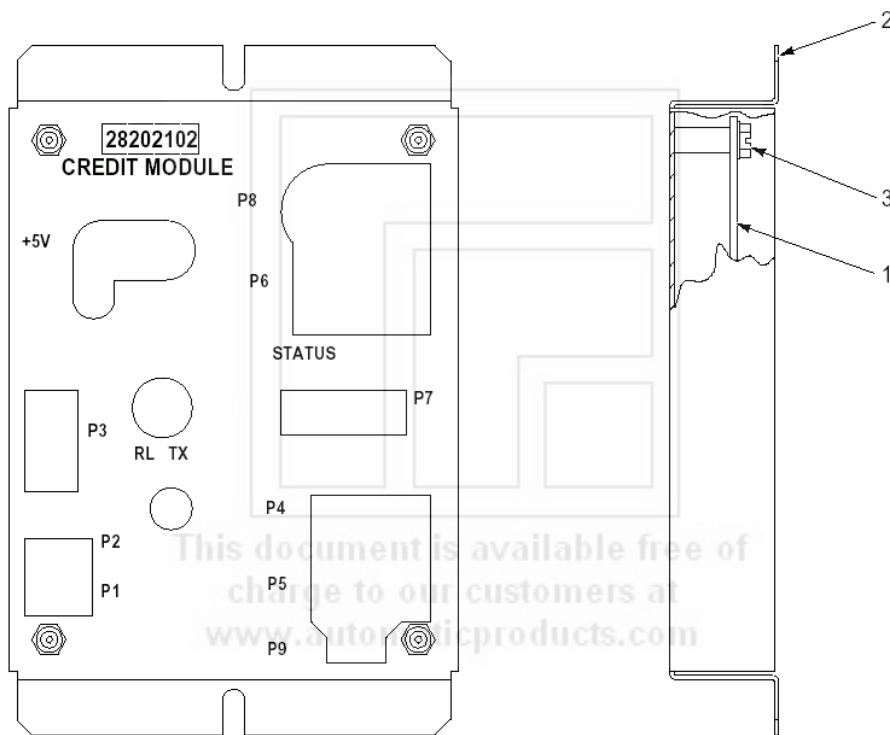
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Key	Part Number	Description	Qty
	R-28201902	Refrig & Turret Control Assembly Complete	
1	R-28200102	Refrigeration/Turret Control Board	1
2	R-28205102	Cover – Refrigeration/Turret Control	1
3	R-80682406	Screw, #6 - 32 x 3/8 Hex	5

Credit Module Assembly

Harnesses

Connector	Part Number	Description
P1	R-28203101	Harness to Message Center
P2	R-28202701	Serial Link Harness to Main Board
P3		Spare Input
P4	R-28203601	Pulse Bill Validator Harness
P5	R-28203301	Executive Coin Mech
P6	R-28203201	Micromech Coin Mech Harness
P7	R-28203401	MDB Peripheral Harness
P8	R-28202501	Harness Power in from Relay Interface

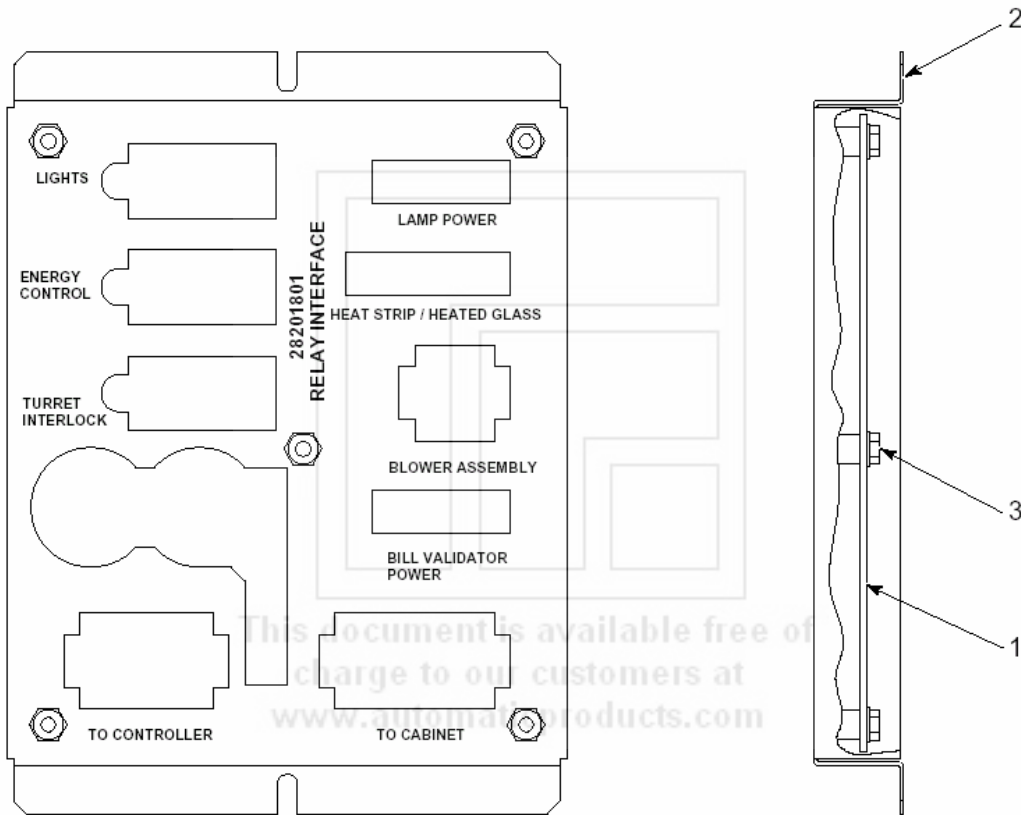


Key	Part Number	Description	Qty
	R-28202102	Credit Module Complete	
1	R-45110602	Board - Credit Module	1
2	R-28205201	Cover - Credit Module	1
3	R-80682406	Screw, #6 - 32 x 3/8	4
NS	R-70039027	Eprom, Specify Revision	1

Relay Interface Assembly

Harnesses

Connector	Part Number	Description
P1	R-28204401	Harness to Ballast Assembly Includes Line Filter
P2		Harness Part of Heater Strip & Glass
P3	R-28204301	Harness to Blower & Heater
P4		Not Used
P5	R-28202401	Harness Power in & To Refrigeration & Turret Module
P6	R-28202501	Power & Serial to Machine Module & Credit Module

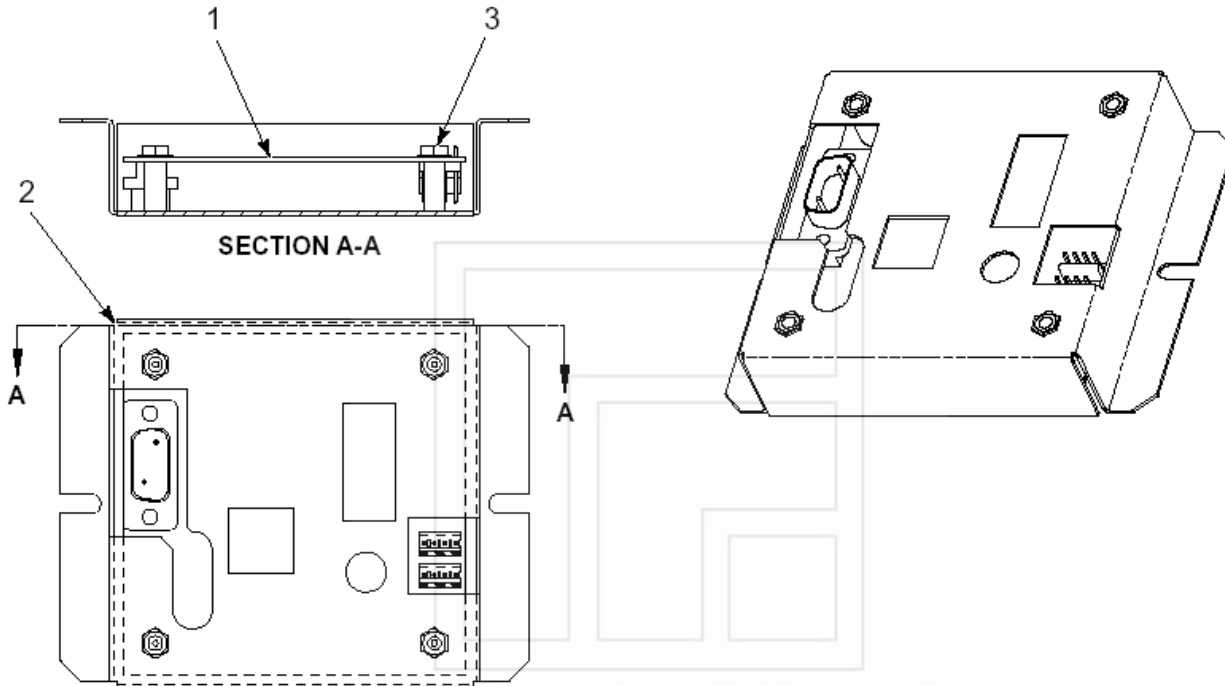


Key	Part Number	Description	Qty
	R-28201801	Relay Interface Board W Cover Complete	
1	R-28201302	Board - Relay Interface	1
2	R-28202402	Cover - Relay Interface	1
3	R-80682406	Screw, #8 - 32 x 3/8	5

Talker Module Assembly (Optional Kit)

Harnesses

Connector	Part Number	Description
P1	R-74801801	Serial Link From Machine Control Module



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Key	Part Number	Description	Qty
	R-28223501	Talker Module Assembly	
1	R-28223101	Board – Talker Module	1
2	R-28223401	Cover - Talker Module	1
3	R-80682406	Screw, #6 - 32 x 3/8 Hex, SEMS WHM, Nickel	4